

Findings from the Injury Control Research Center Portfolio Evaluation







DEPARTMENT OF HEALTH & HUMAN SERVICES · USA

CDC
Injury Prevention

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Note on Source Attribution:

Due to the sensitive nature of this internal report, verbatim quotes and comments are not attributed to specific individuals. Where appropriate and necessary, we make categorical attributions to "CDC staff," "ICRC staff," or "ICRC directors."

Executive Summary

Since 1987, the Centers for Disease Control and Prevention (CDC) has funded the injury control research center (ICRC) program to study injury prevention, to offer training for injury researchers, and to provide technical assistance on injury prevention and control. The ICRC program is administered by the National Center for Injury Prevention and Control (NCIPC), which CDC established in 1992 to reduce injury, disability, death, and costs associated with injuries outside the workplace. The ICRC program has grown substantially since 1987, when it funded 5-year grants to four centers, with each center awarded approximately $500,000 annually. By 2008, the program had expanded to 13 centers that are funded for 5 years and receive approximately $860,000 annually.

This evaluation assessed the value of the ICRC program to CDC-NCIPC's mission to address injury prevention and control. The evaluation was implemented, first, to comply with CDC policy,[1] which requires external peer review of scientific programs conducted or funded by the agency, and, second, to satisfy NCIPC management requirements for improving scientific program design and operations. To evaluate the ICRC program, the NCIPC ICRC Portfolio Evaluation Team researched the following three evaluation questions:

1. How has the ICRC program built the injury prevention and control field?
2. How has the ICRC program affected injury outputs and outcomes?
3. What is the value of the ICRC portfolio, and what is the advantage of the ICRC program versus individual researcher grants?

1 Office of Extramural Research, CDC. CDC Peer Review Policy. Atlanta, GA: CDC; 2008.

To study these questions, the evaluation team followed the steps in the CDC *Framework for Program Evaluation in Public Health*.[2] Because of the centers' long history, volume of projects conducted across a broad range of topic areas, and multitude of nonresearch activities—and changes in the FOAs over time—the ICRC portfolio evaluation team could not conduct an inventory of the ICRCs' activities and research over the last 21 years. Researchers who have studied the evaluation of other large research initiatives have found similar challenges.[3] As such, this evaluation sought to describe the scope of the centers' research and nonresearch activities and to understand the program's contribution to the injury prevention and control field. The evaluation relied primarily on qualitative data to answer the research questions. These data were examined using qualitative data analytic tools and bibliometric analyses.

Regarding the first evaluation question, the findings suggested that the ICRCs have contributed to building the injury prevention and control field by contributing to the creation of a national infrastructure for injury research activities, collaborating with key partners, and training and providing opportunities for injury practitioners, researchers, and students. These activities, in turn, have enabled the ICRCs to conduct multidisciplinary research and public health practice that serve as the foundation for the injury prevention and control field. Regarding the second evaluation question, the findings suggested that the multidisciplinary research and practice that the ICRCs conduct lead to many important outputs, such as publications and policy, and also results in improved acute care, rehabilitation of injuries, and improved injury outcomes. Finally, regarding the third question, the findings suggested that the ICRC program is creating value

[2] Centers for Disease Control and Prevention. Framework for Program Evaluation in Public Health. *MMWR* 1999;48(No. RR-11).

3 Quinlan, K.M., Kane, M. & Trochim, W.M.K. (2008). Evaluation of large research initiatives: Outcomes, challenges, and methodological considerations. In C.L.S. Coryn & M. Scriven (Eds.) Reforming the evaluation of research. *New Directions for Evaluation,* 118, 61_72.

through program benefits such as outreach to local and global communities. In addition, the evaluation found that the advantage of funding the ICRC portfolio is that these program-produced benefits could not be gained through funding to individual researchers.

Based on the overwhelmingly positive findings, the evaluation team offers that the ICRC portfolio is a valuable program that contributes tremendously to CDC's injury prevention and control mission at the local, state, federal, and global levels. CDC should continue to encourage and support the ICRCs' efforts so that the centers remain strong and successful CDC partners poised for future growth in injury prevention and control.

Despite a positive assessment of the ICRC portfolio, however, the evaluation also found that the program could be improved in several ways to increase its usefulness to the injury prevention and control field. ICRC directors and staff, CDC staff, and external peer reviewers identified substantive areas for program improvement, including clarification the ICRC program's long-term sustainability, increased collaboration between ICRCs and CDC, changes to training programs, guidelines for addressing advocacy and policy, suggestions for increasing funding, recommendations related to the competitive review process, additional emphasis on translation research and global research, enhancements in program structure and management, and recommendations related to grantee performance expectations and planning for future ICRC portfolio evaluations. NCIPC leadership, ultimately, will consider these challenges, observations, and recommendations from the external peer review panel and the Board of Scientific Counselors (BSC) when strategizing areas for ICRC program improvement.

Chapter 1. Introduction

The Centers for Disease Control and Prevention (CDC) has funded the injury control research center (ICRC) program since 1987. In that time, ICRC researchers have advanced the injury prevention and control field by conducting multidisciplinary research; developing injury research infrastructure; implementing evidence-based interventions; producing publications; developing products; informing policy; training students, researchers, and practitioners; and providing technical assistance and consultation. The ICRC program is administered by the National Center for Injury Prevention and Control (NCIPC), which CDC established in June 1992 to reduce injury, disability, death, and costs associated with injuries outside the workplace.

This evaluation assesses whether the ICRC program has been valuable to CDC-NCIPC's mission to address injury prevention and control. To make this determination, the NCIPC ICRC Portfolio Evaluation Team researched three areas: 1) how the ICRC program has built the injury prevention and control field, 2) how the program affected injury outputs and outcomes, and 3) what was its overall value and the advantage of funding a program versus individual researchers. This report presents findings from interviews with 12 recent or current ICRC directors and staff and provides examples of ICRC activities and success stories. Finally, the report presents program challenges, observations, and recommendations made by ICRC directors and staff, CDC program staff, and a panel of external peer reviewers. NCIPC leadership, ultimately, will consider these recommendations when strategizing areas for program improvement.

1.1 History of the ICRC Program and the ICRCs

The ICRC program funds centers at universities and other research institutions across the United States to study injury prevention, train injury researchers, and provide technical assistance and consultation in injury prevention and control. The following are the current goals of the ICRC program:[4]

- build the scientific base for the prevention and control of fatal and nonfatal injuries and related disabilities;
- integrate, in the context of a national program, professionals from a wide spectrum of disciplines; such as epidemiology, behavioral and social sciences, medicine, biostatistics, public health, health economics, law, criminal justice, and engineering; to perform research to prevent and control injuries more effectively;
- encourage investigators to propose research that involves intervention development and testing, as well as research on methods, to enhance the adoption and maintenance of effective intervention strategies among individuals, organizations, or communities;
- train injury practitioners, researchers, and students; and
- provide technical assistance to injury prevention and control programs within a geographic region.

CDC funds the ICRCs through a competitive grant mechanism, which requires centers to re-compete for funding at the end of each funding cycle. Throughout the course of the ICRC program, NCIPC has awarded ICRC grants both to universities and other research organizations

[4] 2007 CDC, NCIPC ICRC FOA [funding opportunity announcement], PA [program announcement number]-CE07-001. See Appendix A.

with proven injury prevention research programs and to those that are establishing their injury research capabilities. The ICRC grant program is an open competition, and awards are made based on a program's ability to address newly identified gaps in injury research and its proposed responses to the requirements of the funding opportunity announcement (FOA). (Federal agencies use FOAs to publicize their intentions to award discretionary grants or cooperative agreements, usually as a result of competition for funds.) ICRC proposals with the highest scores, as determined by a team of grant reviewers, are funded.

At the start of the ICRC program in 1987, it funded 5-year grants to four centers, with each center awarded approximately $500,000 annually. By 2008, the program had grown to 13 centers that are funded for 5 years and receive approximately $860,000 annually. Over the history of the ICRC program, CDC has funded 14 centers.

Since 2002, ICRC funding has accounted for approximately 25% to 35% of the total research dollars awarded by NCIPC (reliable ICRC funding data are only available starting in 2002 because a system upgrade that occurred that year changed the way data were maintained). Fourteen centers received funding at some point from 2002 to 2008 (**Table 1.1**), with an average annual grant of $888,524 per center. **Figure 1.1** shows the geographic locations of funded centers. Funding amounts by center and year are only available from 2002 to 2009. Within this timeframe, and with few exceptions, the ICRC grants were similar for each center.

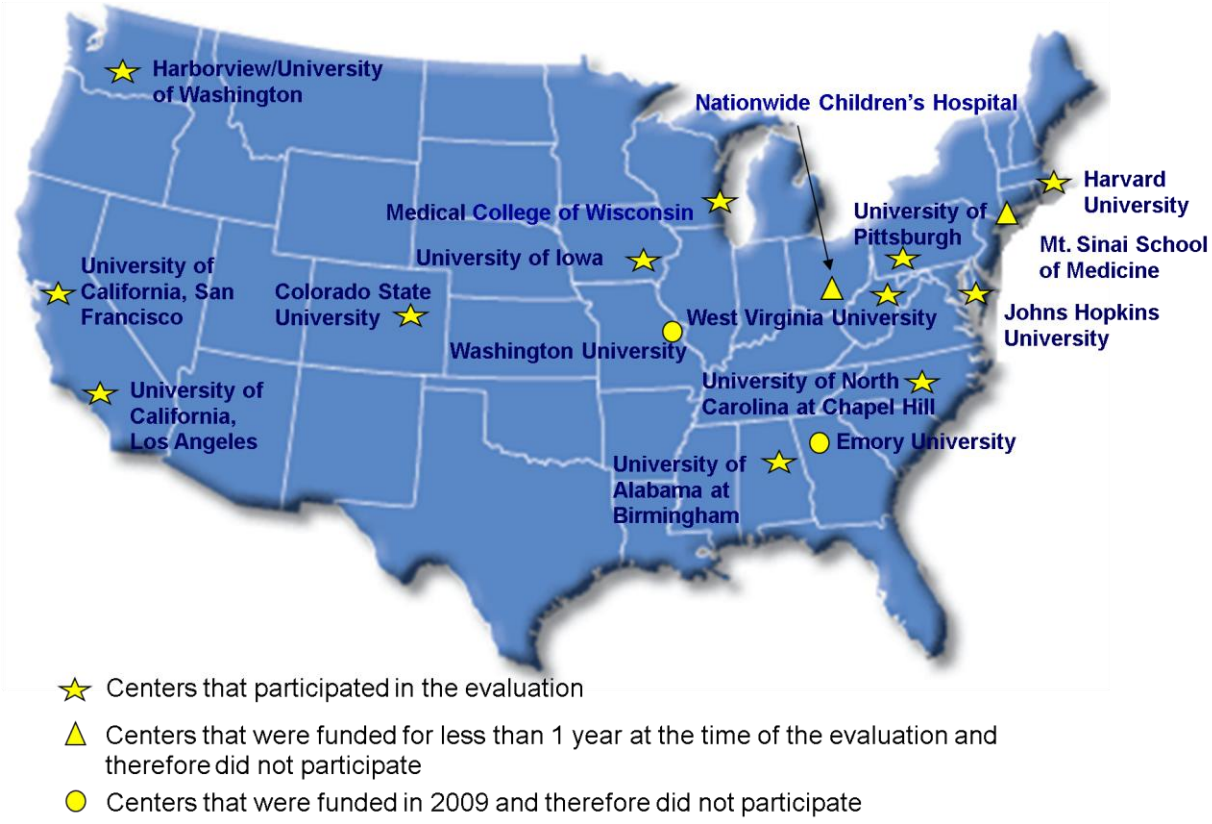
Table 1.1. Injury Control Research Center (ICRC) Names, Locations, and Years Funded, 2008

Center Name	Host Organization	Years Funded
*Center for Injury Research and Policy**	*The Research Institute at Nationwide Children's Hospital*	*<1 year*
Colorado Injury Control Research Center	Colorado State University	13 years
Harborview Injury Prevention and Research Center	University of Washington/ Harborview Medical Center	21 years
Harvard Injury Control Research Center	Harvard University	20 years
Injury Research Center at the Medical College of Wisconsin	Medical College of Wisconsin	7 years
Johns Hopkins Center for Injury Research & Policy	Johns Hopkins University	21 years
*The Mount Sinai Injury Control Research Center**	*Mount Sinai School of Medicine*	*<1 year*
San Francisco Injury Center for Research and Prevention	University of California, San Francisco	19 years
Southern California Injury Prevention Research Center	University of California, Los Angeles	19 years
University of Alabama at Birmingham, Injury Control Research Center	University of Alabama at Birmingham	19 years
University of Iowa Injury Prevention Research Center	University of Iowa	18 years
University of North Carolina Injury Prevention Research Center	University of North Carolina, Chapel Hill	21 years
University of Pittsburgh Center for Injury Research & Control	University of Pittsburgh	13 years
West Virginia University Injury Control Research Center	West Virginia University	4 years

**Centers in italics did not participate in the evaluation, because they were funded for less than a year at the beginning of the evaluation in October 2008. However during the evaluation, these centers were involved in discussions related to the evaluation plan, logic models, and preliminary findings, and therefore, are acknowledged in this table.*

The CDC-ICRC funding helps the ICRCs conduct research in a wide variety of injury topic areas, including violence prevention; acute care, rehabilitation, and disability; traumatic brain injury; transportation-related injury prevention; sports and recreation; disaster preparedness; and injuries among older adults. The ICRCs' contribution to the injury prevention and control field, however, goes beyond their research. The centers provide training for students and professionals; conduct data collection and analysis for partner organizations; implement and evaluate interventions in their communities; and work with local, state, tribal, and national leaders to support and craft effective injury prevention policy. These individual contributions of the ICRCs are the measurable outcomes of the ICRC program.

Figure 1.1. Geographic Locations of Current and Past Funded Injury Control Research Centers (ICRC), 2009



1.2 Evaluation Requirement

This ICRC portfolio evaluation was mandated by a CDC policy requiring that, as of October 1, 2005, centers, institutes, and offices (CIOs) use external peer reviewers to assess extramural research projects with direct costs of $100,000 or more, at inception, for scientific and technical quality. The policy also requires that CIOs review all studies relative to them at least every 5 years and that intramural research programs must be reviewed by a special emphasis panel or certain other approved mechanisms every 5 years.[5]

[5] Office of Extramural Research, CDC. CDC peer review policy. Atlanta, GA: CDC; 2002.

Based upon the requirements of this CDC policy, the ICRC portfolio evaluation team, consisting of CDC-NCIPC staff and contractors from the MayaTech Corporation, conducted this evaluation. An external peer review panel reviewed the findings and provided individual recommendations on the program at a 2-day meeting in November 2009. The evaluation findings and the external peer review panel's recommendations will be presented to NCIPC's Board of Scientific Counselors (BSC) in winter 2010. The BSC will identify consensus recommendations on the ICRC program for NCIPC's consideration and implementation.

1.3 Evaluation

This study evaluated the overall ICRC program, not the individual centers or projects housed in the centers. In designing the program evaluation, the evaluation team used three overarching goals to guide the process:

1. assess the relevance, quality, and significance of the ICRC program;
2. highlight success stories over the course of the program; and
3. identify research and programmatic gaps and foci for guiding NCIPC policy, funding, and staffing decisions.

The report does not specifically address these goals; however, the goals did inform the study's research methodology, the interview questions, and the data analyses. The Institute of Medicine's report, *NIH Extramural Research Center Programs: Criteria for Initiation and Evaluation*[6] also guided the evaluation. In addition, the ICRC program's relevance, quality, and

[6] National Academy of Sciences. *NIH Extramural Center Programs: Criteria for Initiation and Evaluation*. National Academies Press, Washington, D.C., 2004.

significance are discussed throughout the report; four program success stories are provided at the end of the report; and program challenges and recommendations are included in Chapter 7 to guide NCIPC leadership in making policy, funding, and staffing decisions.

Because of the centers' long history, volume of projects conducted across a broad range of topic areas, and multitude of nonresearch activities—and changes in the FOAs over time—the ICRC portfolio evaluation team could not conduct an inventory of the ICRCs' activities and research over the last 21 years. Instead, this evaluation sought to describe the scope of the centers' research and nonresearch activities and to understand the program's contribution to the injury prevention and control field.

The CDC ICRC grant is only one funding source for the centers, which rely on a mix of federal, state, and private funding to conduct injury prevention work. Because of these multiple funding sources, the successes of the ICRCs cannot be attributed directly to the CDC ICRC program. However, this program certainly plays an important role in the ICRCs' ability to conduct the wide variety of activities described in this report.

1.4 Evaluation Questions

Several stakeholders, including CDC and NCIPC leadership, CDC ICRC program management staff, ICRC directors and staff, and policy makers, had questions about the ICRC program. The evaluation team used these questions to help guide the evaluation design and to develop the following three evaluation questions:

1. How has the ICRC program built the injury prevention and control field?

2. How has the ICRC program affected injury outputs and outcomes?

3. What is the value of the ICRC portfolio, and what is the advantage of the ICRC program versus individual researcher grants?

Conclusion

NCIPC funds ICRCs at universities and other research institutions across the United States to study injury prevention and to provide training to injury researchers. The ICRC portfolio evaluation team developed three evaluation questions to assess whether this program has been valuable to NCIPC's injury prevention and control mission. To study these questions, the evaluation team used the CDC *Framework for Program Evaluation in Public Health*, which is discussed in detail in the next chapter.

Chapter 2. Methods

To plan and implement the portfolio evaluation, the evaluation team used the conceptual parameters of the Centers for Disease Control and Prevention (CDC)'s *Framework for Program Evaluation in Public Health*.[7]

The six steps of the framework are to 1) engage stakeholders, 2) describe the program, 3) focus the evaluation design, 4) gather credible evidence, 5) justify conclusions, and 6) ensure use of and share lessons learned. For this project, the evaluation team addressed the first four steps through an assessment plan that included administrative and project document reviews, individual ICRC site visits, in-depth interviews with ICRC directors and CDC staff, and success story interviews. Evaluators used qualitative analytic tools and bibliometric approaches to analyze the data collected from the assessment plan. The last two steps will be accomplished when these findings are presented to the NCIPC Board of Scientific Counselors (BSC) for critical review and the board's subsequent recommendations for the program are implemented.

2.1 Engage Stakeholders

The first step in the evaluation framework of the ICRC portfolio was to engage stakeholders. Primary stakeholders included NCIPC leadership and staff and the ICRC directors who participated in data collection.

Secondary stakeholders included the NCIPC Injury Portfolio Evaluation Workgroup (IPEW) and an external peer review panel. IPEW was tasked with reviewing the evaluation team's work to

[7] Centers for Disease Control and Prevention. Framework for Program Evaluation in Public Health. *MMWR* 1999;48(No. RR-11).

ensure that valid evaluation questions were addressed and appropriate evaluation methods were used. Members of IPEW included select staff members from NCIPC, program evaluators from programs at CDC, and two ICRC directors. The external peer review panel reviewed the final report and provided individual recommendations for program improvement.

Another stakeholder is the NCIPC BSC, which will review the external peer review panel's recommendations and suggest program improvements to NCIPC leadership. NCIPC leaders, as the ultimate stakeholders in the ICRC portfolio evaluation, will decide which of these recommendations to implement.

2.2 Describe the Program

The second step in this evaluation's framework was to describe the program. As suggested by the CDC *Framework for Program Evaluation in Public Health* and as demonstrated through other program and portfolio reviews within CDC[8] , the evaluation team developed logic models to describe the ICRC program in detail. Logic models translate the dynamic interactions of complex programs into domains that clearly and accurately describe the programmatic resources, activities, outputs, and outcomes.[9] In this evaluation, key stakeholders, including NCIPC leadership and staff, ICRC directors, and evaluation experts, worked with the evaluation team to develop logic models that describe the ICRC program and evaluation outcomes.

The first logic model depicts NCIPC requirements for the ICRCs as identified in the 2000, 2003, 2004, and 2007 funding opportunity announcements (FOAs) (**Figure 2.1**).

[8] Engel-Cox, J.A., van Houten, B., Phelps, J. & Rose, S.W. (2008). Conceptual model of comprehensive research metrics for improved human health and environment. *Environmental Health Perspectives*, 116, 5, 583-592.
[9] W.M. Kellogg Foundation. (2004). *Logic model development guide*. Battle Creek, MI.

Evaluators discovered only minor differences in the FOAs from the mentioned years as related to inputs or required ICRC activities, outputs, and outcomes. Specifically, the logic model in Figure 2.1 identifies inputs from NCIPC, the ICRCs, and other injury partners, as well as required ICRC activities, the outputs of those activities, and NCIPC's outcomes for the ICRC program.

The second model, the implementation logic model (**Figure 2.2**), illustrates the ICRCs' actual activities and was developed from reviews of centers' Web sites and document reviews and feedback from ICRC directors. Because it shows actual center operations, the implementation model is more complex than the FOA model. This increased complexity is indicated by the purple boxes, which are components found in the implementation model but not in the FOA model. This implementation logic model illustrates the vast amount of work the centers conduct to build the injury prevention and control field.

The implementation model also distinguishes between short- and longer term outcomes. Short-term outcomes are defined by proximate relationships to longer term outcomes. That is, the shorter term outcome generally occurs prior to the longer term outcome (e.g., increased public awareness occurs prior to general behavioral and/or policy changes). The evaluation team determined that depicting the relationships between outcomes was important because much of what the ICRCs produce has not yet resulted in quantifiable changes in ultimate health goals.

Figure 2.1. Funding Opportunity Announcement Logic Model for the Injury Control Research Center Portfolio Evaluation

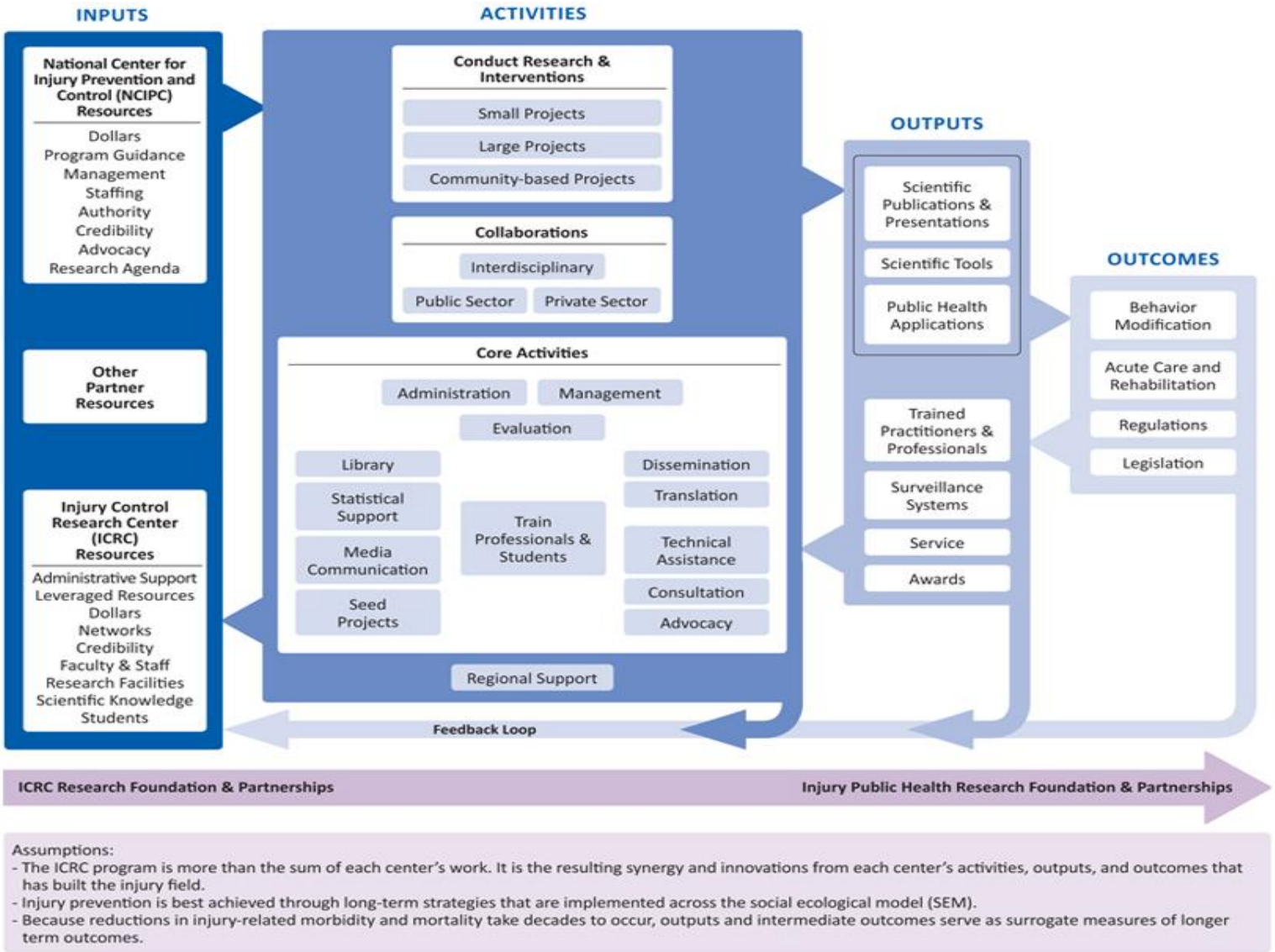
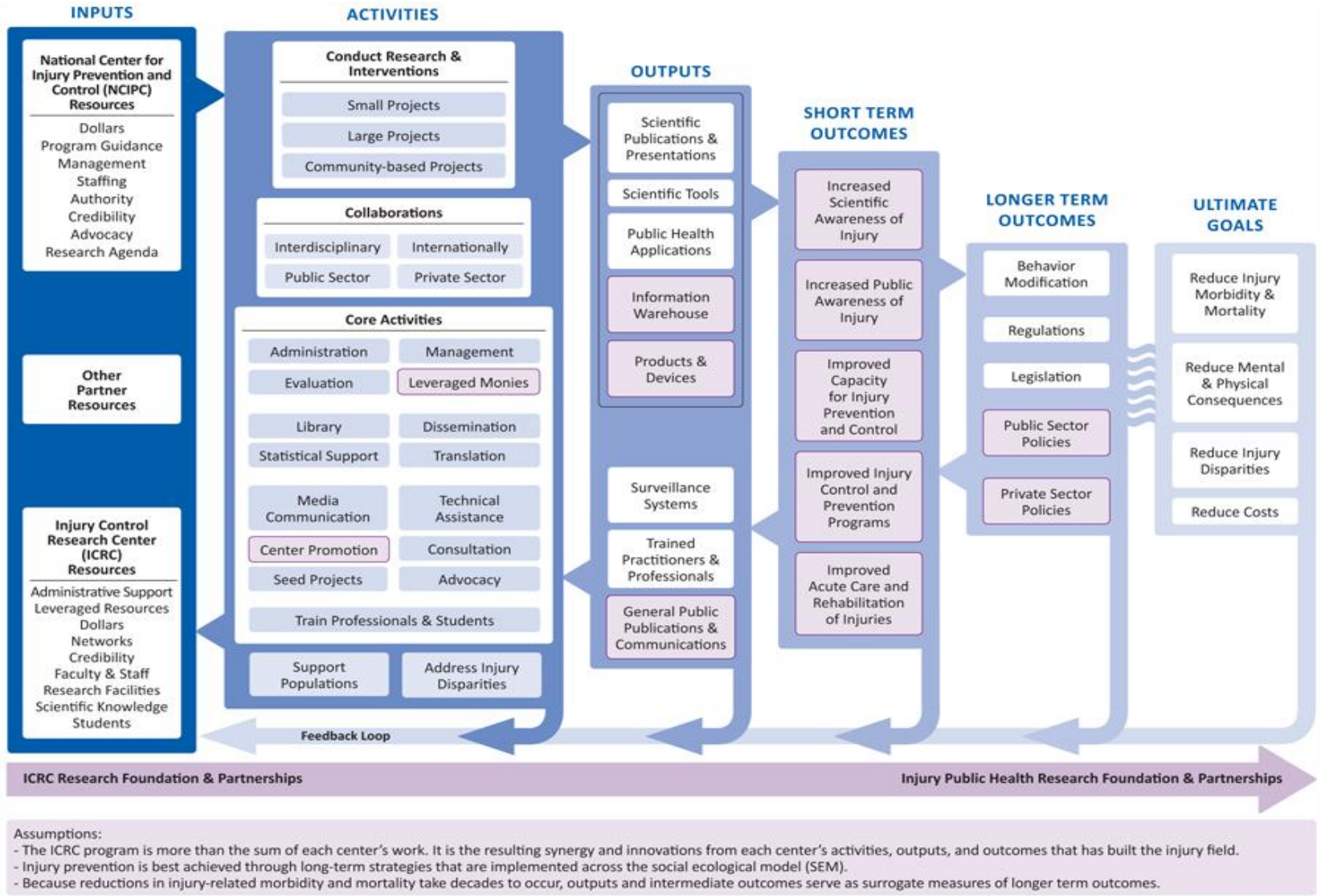


Figure 2.2. Implementation Logic Model for the Injury Control Research Center Portfolio Evaluation



After their development, both logic models underwent review. NCIPC staff and ICRC directors examined the logic models to ensure their accuracy. IPEW also reviewed the models and made significant, substantive suggestions for changes.

When finalized, the two logic models provided NCIPC staff with a clear picture of the purpose, role, and outputs of the ICRCs and also served as the foundation for designing the information collection instruments used in the ICRC portfolio evaluation. Taken together, the two models illustrate the vast amount of work the centers do beyond what is required in the FOAs. The report highlights these areas of divergence in Chapter 5.

2.3 Focus the Evaluation Design

The third step in the evaluation framework of the ICRC portfolio was focusing the evaluation design. Because of the nature of the evaluation goals and research questions, the lengthy history of the ICRCs, the immense volume of research, and the broad range of activities the ICRCs conduct, the evaluation team adopted a qualitative evaluation design. The qualitative design enabled the evaluation team to adapt the data collection as necessary to explore themes, topics, and ideas that surfaced during interviews with ICRC directors and CDC staff.

In designing the evaluation, the team considered challenges associated with assessing research portfolios. The evaluation literature is rich with information on how to evaluate individual public health programs and research projects. However, effective methods for evaluating a portfolio of research are less understood. Only a few large organizations have such portfolios, and, unlike biomedical research, public health research is interdisciplinary and broad based by

definition. Researchers who have studied the evaluation of large research initiatives have found that challenges include the long-term nature of scientific research; difficulty in tracking students and other trainees over time; variability in context, structure, and research areas among the centers; and the competing requirements among funding sources.[10]

2.4 Gather Credible Evidence

The fourth step in the evaluation framework was gathering credible evidence. To address the challenges described above, the NCIPC ICRC Portfolio Evaluation Team used a multipronged approach to obtain information for the evaluation to answer the three evaluation questions. The approach included the following strategies:

- **Document Reviews and Logic Model Development**: The evaluation team reviewed background information to develop the logic models.

- **ICRC Site Visits**: The evaluation team conducted site visits with two ICRCs to develop the interview protocol and information collection questionnaire.

- **In-Depth Interviews with ICRC Directors**: The evaluation team conducted in-depth telephone interviews with ICRC directors and other key staff using a questionnaire.

- **Interviews with CDC Staff:** Nine former and current CDC staff members were interviewed and provided their input and recommendations on the ICRC program. These staff interviews also provided an historical perspective of the program.

[10] Quinlan, K.M., Kane, M., & Trochim, W.M.K. (2008). Evaluation of large research initiatives: Outcomes, challenges, and methodological considerations. In C.L.S. Coryn & M. Scriven (Eds.) Reforming the evaluation of research. *New Directions for Evaluation*, 118, 61–72.

- **Success Story Development:** To highlight some of the ICRCs' pivotal work, the evaluation team collected data to develop four success stories, which are included as Appendix B. These studies showcase projects that have served unique populations, included efficacy and translational research, and/or resulted in a concrete outcomes.

- **Bibliometric Analysis:** The evaluation team asked each ICRC to submit a list of its 15 most influential publications and then conducted a bibliometric analysis of these publications from peer-reviewed journals.

The evaluation team collected much of the study's data through the telephone interviews with ICRC directors and staff. When possible, evaluators verified responses by reviewing the centers' publications and other publicly accessible documents. (See Appendix C for an overview of the evaluation methodology and Appendix D for the information collection instruments used.)

Also, when possible, the evaluation team documented the effects of ICRC research on the ultimate goals identified in the implementation logic model, such as reducing injury morbidity and mortality. In most cases, however, the centers were not able to show change in these longer term outcomes. These outcomes cannot be quantified because of the length of time needed to realize changes in such long-term outcomes, the influence of other external factors that may affect injury morbidity and mortality rates, and the lack of a requirement in the FOAs for centers to measure these types of outputs.

Eleven currently funded ICRCs and one previously funded ICRC participated in the evaluation. Two additional centers had been funded for less than a year at the time of the evaluation. In

consultation with IPEW, the evaluation team determined that these two centers could not answer the evaluation research questions with meaningful data. However, these two newly funded centers may have different characteristics and services from the other centers and will be examined in future evaluations. (See Appendix E for profiles of all ICRCs.)

2.5 Analyze the Data

After performing the first four steps in the evaluation's framework, the evaluation team analyzed the gathered data. First, the team managed and analyzed the qualitative data collected from the two ICRC site visits by using QSR NUD*IST version 5.0 qualitative software. The team focused its data analyses on extracting common and divergent themes and correlating themes with center activities, outputs, and outcomes. Common themes indicated a domain of critical importance. Conversely, uncommon themes indicated a unique perspective or a new insight. This thematic analysis provided critical insights for developing the in-depth interview questionnaire.

The evaluation team then used Microsoft Excel to manage and analyze the data collected from the in-depth interviews with the ICRCs and the interviews with current and former CDC staff. The evaluators used content analyses to summarize the qualitative data for the report. For the limited quantitative data, the evaluation team focused its statistical analyses on descriptive statistics, such as frequencies and percentages, which supplemented the qualitative data.

The evaluation team also conducted bibliometric analyses of the 15 most influential publications each ICRC had submitted. To determine the impact of each publication, the team searched Thomson Reuters' Web of Science® (WoS) and measured the number of times each

reported journal article was cited by other researchers. To determine the publishing journals' impact factors, the team used both the Science and Social Science Journal Citation Reports databases in the WoS. Impact factors measure the frequency a typical article in a particular journal is cited within a given year. Impact factors are useful as a proxy measurement of quality, but they should be used carefully because of the many factors that influence citation patterns.[11]

Conclusion

The ICRC portfolio evaluation team studied the three evaluation questions by following the steps in the CDC *Framework for Program Evaluation in Public Health*. The evaluation team addressed the first four steps through various document reviews and staff interviews and individual ICRC site visits. (The last two steps will be accomplished when the findings are presented to the BSC for critical review and the board's subsequent recommendations for the program are implemented.) Evaluators used qualitative analytic tools and bibliometric approaches to analyze the data. The results from these data analyses provided the evaluation team with answers to the three evaluation questions. The findings of the first evaluation question—how has the ICRC program built the injury prevention and control field?—are explored in the next chapter.

[11] Borgman, C.L., & Furner, J. (2002). Scholarly Communication and Bibliometrics. In B. Cronin (Ed.), *Annual Review of Information Science and Technology, Vol 36.* Medford, NJ: Information Today, pp 3–72.

Chapter 3. Findings: How Has the ICRC Program Built the Injury Prevention and Control Field?

One of the three evaluation questions that the National Center for Injury Prevention and Control Injury Control Research Center (ICRC) Portfolio Evaluation Team explored was: How has the ICRC program built the injury prevention and control field? Findings from the data analyses suggested that the program has contributed to building the field of injury prevention and control by enabling the centers to contribute to the creation of the infrastructure for injury research activities, collaborate with key partners, and train injury researchers. With limited funding, the ICRCs have performed a wide breadth of activities, which in turn, has enabled them to conduct multidisciplinary public health research and practice that serves as the foundation for the injury prevention and control field.

The logic models in Chapter 2 illustrated the variety of activities the centers conduct, including many undertakings that are not required in the FOAs. The activities column of the logic models provides the framework by which the contributions of the ICRCs can be understood. The contributions described below are some of the key activities conducted by the ICRCs to build the injury prevention and control field.

3.1 Infrastructure

The portfolio evaluation findings suggested that one way the ICRC program has contributed to building the injury prevention and control field is by creating an internal infrastructure for injury research activities. This infrastructure binds together the centers' research, collaboration, and training activities to produce the research outcomes that are critical for strengthening and

sustaining the injury prevention and control field. Because the Centers for Disease Control and Prevention (CDC) funds the centers, in addition to individual researchers, the ICRCs can use their grants to cover the costs associated with developing and sustaining center research infrastructure. This infrastructure includes conducting administrative activities and building and maintaining center libraries, databases, laboratories, and other equipment.

The findings also showed that the ICRCs consider the development of human resources to be one of their most important infrastructure activities. The centers use their infrastructure funding to support staff in conducting administrative activities, providing research support services, disseminating publications, and evaluating center goals and objectives. Having these specific human resources enables researchers to, instead, focus on multidisciplinary research practice, collaboration, teaching, and training.

3.1.1 Administrative Activities

Although centers typically receive other funding to support core research activities, the ICRC grant enables them to hire administrative staff to support the researchers. This need for administrative support remains constant throughout the life of the center and does not decrease as the center matures. Administrative staff members relieve some of the grants management burden on the researchers by handling budgets and accounting, progress reports, and general university relations. They also contribute to the strategic planning process, maintain center Web sites, publish center newsletters, and plan meetings and conferences. Administrative staff are important because they support the daily operations of the centers and

free center faculty to perform other duties, such as teaching, researching, and pursuing other sources for center funding.

3.1.2 Research Support Services

The ICRCs also build their infrastructure by giving injury scientists access to staff members who provide research support services, such as statistical analyses, research method design, information collection instrument design, and data entry. Students, research assistants, and junior staff are typically available to fill these positions; however, the multidisciplinary nature of the ICRCs enables senior staff members to also serve as consultants on various research projects. Research support staff provide essential services to faculty and researchers, which may give centers a competitive advantage when preparing grant applications outside of the ICRC program. At some ICRCs, research support staff free up the faculty and researchers to concentrate on grant writing, while at other centers, they actually help perform the grant writing. In the long term, these types of research support services may increase the quality and quantity of injury research.

> *"The center's biostatistics core unit includes four faculty-level statisticians available to help investigators, as well as a full-time manager and graduate students to do data management and analysis."*
>
> *ICRC Director*

3.1.3 Dissemination of Research Findings

Although ICRC researchers help disseminate their own research findings, center directors acknowledged that other resources are also available to assist in dissemination. For example, four center directors reported having a specific staff person who handles communication and

dissemination activities. One center director indicated that dissemination is done by a team that includes a researcher, center communications director, and a university representative. In addition, because ICRCs are located in university settings, they can draw on the resources of their host institutions for dissemination activities, thus helping the centers maximize their grant dollars for research. For example, six of the ICRCs reported that, as university-sponsored research centers, they have access to university resources, such as the media office, the press facility, the public affairs office, and experts in the colleges of medicine and public health, to aid in their dissemination activities.[12] Finally, ICRC directors also commented that establishing good relationships with local media outlets facilitates the dissemination of research findings among the general public.

3.1.4 Information Warehousing

Because of their research activities, the ICRCs are sources of injury prevention information for their constituents and stakeholders at the local, state, tribal, national, and global levels. As they implement research, conduct programs and interventions, and work in their communities, the centers collect vast amounts of data and training materials that they use to promote injury prevention messages to the general public. This activity is described in the implementation logic model (see p. 14) as information warehousing, which is defined as the collection, storage, and maintenance of information or other resources. Some centers reported that local communities, health officials, and, at times, policy makers have used this knowledge base to create solutions

[12] All centers were asked the following question: How does your ICRC share information about the ICRC's research activities with the general public, practitioners, and the scientific community? When appropriate to their response, some centers were asked a follow-up question related to resources used for dissemination activities. Therefore, this question was not asked of all 12 centers. Six of the 12 centers specifically mentioned being able to use university resources. The other six centers did not mention these resources and; therefore, may or may not have access to them.

to injury problems. Although the ICRC funding opportunity announcement (FOA) does not require centers to provide this knowledge base, this service is a by-product of all the work conducted by the ICRCs and is a critical contribution of many of the centers. This service is also one that the ICRCs provide for which no other source of funding permits.

3.1.5 Leveraging of Additional Funds

One way the centers build their infrastructure is by leveraging these ICRC grants to obtain additional funding. All 12 centers participating in the evaluation reported leveraging funding from other Health and Human Services agencies including National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), Health Resources and Services Administration (HRSA), Agency for Healthcare Research and Quality (AHRQ), Administration for Children and Families (ACF), Centers for Medicaid and Medicare Services (CMS), and the Indian Health Service (IHS). Others sources of federal support include the Departments of Transportation, Justice, Defense, and Education, as well as the Federal Emergency Management Agency and the National Science Foundation. Ten centers indicated that they leverage additional support from private sources such as foundations, insurance agencies, and law firms. Nine centers obtained funding from state sources, including state departments of health, public safety, and transportation. Four centers also received financial support from trade associations such as the American Association for the Surgery of Trauma and the American Orthopedic Society for Sports Medicine.

Although most of the leveraged monies are targeted for injury research and not infrastructure activities, center leadership, researchers, and administrative staff all contribute to the

fundraising efforts. The ICRC FOA does not require centers to conduct additional fundraising, but the centers and CDC inherently understand that obtaining non-CDC support is critical to their growth, mission, and ability to build and sustain the injury prevention and control field.

A few of the strategies that centers use to leverage their ICRC grants are to

- collect pilot data that demonstrate the worthiness of a research project for other funders;
- train partners in program and grant writing to enhance their ability to obtain funding and then collaborate on projects with these partners;
- train students who eventually are hired as faculty and who write grants to bring additional dollars to the ICRCs; and
- support administrative staff members who can help with grant applications.

3.1.6 Evaluation and Monitoring Activities

To assess their progress in achieving the goals and objectives of the ICRC program, the centers conduct internal evaluation and monitoring activities, which serve to strengthen their research infrastructure. Nine of the 12 centers that participated in the ICRC portfolio evaluation have used internal staff to conduct their evaluation and monitoring activities, and the other three have worked with an external evaluator or advisory group. Over the history of the ICRC program, many of the centers have worked with both internal and external evaluators.

To evaluate their center activities, ICRCs

- prepare annual reports;
- count publications, students trained, products, and other activities;
- monitor the quality and impact of researcher publications;
- conduct monthly management meetings;
- develop a center strategic plan that includes measurable outcomes;
- develop progress indicators for research, training, and outreach;
- conduct annual meetings with faculty, researchers, and center staff;
- conduct annual reviews of center staff;
- survey center researchers to assess satisfaction with center activities;
- conduct quarterly project reviews;
- invite external researchers to review project progress; and
- create logic models to illustrate the program.

Although the centers conduct evaluation and monitoring to fulfill the requirements of the FOA, they indicated that they also use the results from these evaluation activities to

- assist with maintaining fiscal integrity and balance;
- increase attention for the center and injury research within the university;
- improve programs;
- identify areas for growth;
- assist with programmatic decision-making;
- leverage resources;
- document activities and progress for stakeholders;
- guide new research areas; and

- provide information to others who may want to implement similar activities.

Data gathered from these center evaluations could also be shared at the national level to demonstrate the capacity and contributions of the ICRCs.

The ICRCs' evaluation and monitoring activities benefit not only individual centers but injury research in general. The centers' evaluation activities are intended to satisfy FOA requirements, but the centers use the results of this monitoring to also build their infrastructure, leverage more dollars, conduct more research, and build more partnerships. Through these improvements, the ICRCs have created a dynamic system in which a center reinvests in itself to produce more injury prevention research that builds the injury prevention and control field as a whole.

In summary, through CDC funding, the ICRCs have built their infrastructure by conducting administrative activities, providing research support services, disseminating research findings, developing a knowledge base for their communities, leveraging their funding, and evaluating center goals and objectives. The centers sustain this research infrastructure by conducting the following activities:

- developing relationships within the university;
- aligning with specific university departments;
- conducting training activities; and
- fostering professional development.

As the next two sections show, this critical collaboration and training both support the ICRCs' research infrastructure and contribute to building the injury prevention and control field.

3.2 Collaborations

The portfolio evaluation findings suggested that the long-standing collaborations the ICRCs develop within and beyond their universities are key to the centers' ability to conduct quality research and, ultimately, to build the injury prevention and control field. CDC funding has been critical to the development of this collaborative environment. For example, CDC ICRC funding gives the centers time to participate in coalitions and advisory groups, respond to inquiries, provide data analysis and support services, and undertake other activities that are not directly related to research.

In turn, these activities allow the centers to develop strong, sustainable collaborations with partners, such as other researchers; other universities; medical institutions; community groups; state and local government agencies, including public health agencies; and policy makers. (Examples of collaborations with these partners are provided throughout the report and in Appendix G.) Through these collaborations, ICRCs can conduct research with data provided by partners, work with partners to translate injury research into practice and policy, and provide partners with training and technical assistance or serve them in another advisory role. Collaboration activities also provide visibility for centers, help centers and communities advocate for children and underserved populations, and develop community programming and interventions.

Internal collaborations between the ICRC and its university host result in a multidisciplinary approach to research that combines various expertise, perspectives, and fields of study. For example, a center working with its university on a project may bring together experts in

research methods, including study design, data analysis, dissemination, and communication. In addition, centers commented that they develop and maintain partnerships and collaborations among a multidisciplinary group of staff, students, and faculty throughout their host universities. Finally, the research projects conducted at ICRCs require input from a wide variety of fields, including medical, public health, engineering, social sciences, art, urban planning, and agriculture, and university settings are good sources of experts in these fields. For example, an ICRC infrastructure has been able to bring together individuals from 26 departments at the university to conduct injury work. This collaboration increases the multidisciplinary resources and perspectives available to the center's injury researchers, enriching their research, practice, and final injury products.

The centers also rely on their relationships with their universities or affiliated medical systems to generate research ideas, recruit researchers, develop connections in the community, and identify individuals and families affected by injury. All of these activities promote research within the centers. For example, a few ICRCs indicate that being affiliated with a trauma center was important to promoting injury research in their centers. ICRCs reported that being connected to a university or trauma center enables them to align their research and training programs with specific university departments, build on the schools' strong reputations, and provide access to excellent students and a diverse student body. These factors ultimately enable the ICRCs to be successful in producing research that effect individuals and populations.

The centers also reported on collaborations with other ICRCs, both CDC-funded and non-CDC-funded centers. In addition, every ICRC reported at least one partnership with another ICRC.

Most of these collaborations involved conducting joint research projects and preparing publications; providing guest lectures; serving in advisory or leadership roles; and creating treatment protocols, injury curriculums, and data systems.

An example of the collaboration among centers is the work of the University of North Carolina (UNC) Injury Prevention Research Center, the Johns Hopkins Center for Injury Research and Policy, the Colorado Injury Control Research Center, the University of Pittsburgh Center for Injury Research & Control, and the University of Iowa Injury Prevention Research Center to create the Society for the Advancement of Violence and Injury Research (SAVIR). SAVIR's mission is to promote scholarly activity in the prevention, control, acute care, and rehabilitation of intentional and unintentional injury. A committee was formed within SAVIR to develop the National Training Initiative for Injury and Violence Prevention, which includes core competencies for injury and violence prevention. These core competencies are available at www.injuryed.org and were published in the April 2009 issue of the *American Journal of Public Health* as a guide to injury research infrastructure development.

The ICRCs also collaborate with partners outside their host institutions. These partners include state and local agencies, such as public health departments; federal agencies, such as the National Highway Traffic Safety Administration (NHTSA) and the National Institutes for Occupational Safety and Health (NIOSH); community groups; and global entities. Many ICRCs reported long-term collaborations, with some partnerships predating the CDC ICRC funding. The portfolio evaluation found that the centers' most influential collaborations range in length from 2 to 21 years, with most relationships having been in place for 10 years or more. The

ICRCs attribute the longevity of these relationships to centers' ability to provide valuable data, research, and training and to the partners' recognition of the ICRCs as critical in conducting injury prevention work.

An example of a long-term collaboration is the partnership between an ICRC and NHTSA, which has been in place for more than 15 years. Because the ICRC's contractual obligations with the University prohibit them from lobbying legislators, this collaboration allows the center to use its research to educate policy makers. Members of the partnership can testify as experts using the ICRC's research findings and data. This relationship allows other agencies to do advocacy work while the ICRC remains the impartial scientific partner able to inform public policy. The ICRC's work with NHTSA has resulted in seat-belt legislation, child booster seat intervention and legislation, and motorcycle helmet research and legislation. The collaboration with NHTSA allows the ICRC to translate its research into policy change that can effectively reduce injury, illustrating that these collaborations are essential for the center's work to move beyond research and ensure sustainability of injury prevention efforts.

3.3 Training

The evaluation findings suggested that the centers view human resources, including the training of practitioners, researchers, and students to conduct injury research, as one of the most critical components of their infrastructure. Training and educating students and professionals in the injury prevention and control field has been a priority for the ICRCs since the inception of the program. The centers provide a place for students and professionals to train, receive funding, and grow their research interests and expertise. By training a new generation of

researchers, the ICRCs help to build the injury prevention and control field by ensuring that injury prevention research continues to grow, addresses new problems, and reaches new populations.

The ICRCs train and educate three primary populations:

1. students within the university system;
2. university faculty and staff; and
3. injury professional, such as department of health staff, first responders, and other medical professionals.

Because of the longevity of many of the ICRCs, this evaluation could not inventory all the training activities conducted by the centers. However, the next three sections highlight the ICRCs' training activities for each of the three populations.

3.3.1 Students

In the evaluation's findings, CDC program staff readily acknowledged how vital the centers are in growing the injury prevention and control field by training the next generation of injury researchers. For example, all ICRCs provide injury research courses for students at their host universities. Other training opportunities for students include injury-focused lectures as part of other public health courses, research institutes and seminars, research grants, and faculty mentorship and guidance on injury-focused dissertations and theses.

Specific examples of how the centers incorporate injury training into their programs include the following:

- The Southern California Injury Prevention Research Center provide guest lecture opportunities for injury researchers that are used to pique the interest of students at the academic institution.

- Teach an injury lectures in every core course in the university's public health program, and incorporation of injury lectures in over 25 courses taught in more than nine of the university's departments.

- Host injury seminars or institutes during the summer for students and professionals.

> *"Working with the injury prevention research center is the best decision that I ever made career-wise."*
>
> *Graduate Student at an ICRC*

This evaluation found that recruiting students to the injury prevention and control field is a challenge because of the limited funding available for assistantships and the lack of exposure that most students have to injury. To address the recruitment challenge and build interest in the injury prevention and control field among students, the centers have developed a wide array of educational and training activities geared to students. The ICRCs market these activities throughout the universities by using flyers, word of mouth, and e-mails. This education and training typically focuses on the graduate level and includes opportunities for classes, seminars, research, and working with ICRC researchers.

To evaluate how the ICRCs' training programs contribute to the injury prevention and control field, the evaluation team asked the centers to estimate the number of graduate students who graduated from their host universities with an injury emphasis or concentration and to specify by degree type, if available. Not all centers had information available to answer the question, and some centers provided more than one response. Responses included

- 93 graduates with degrees with an injury emphasis over 13 years;
- 27 graduates with an injury emphasis over 4 years;
- 296 graduates with an injury concentration over the last 13 years;
- 157 graduates with varying degrees over 20 years with an injury emphasis;
- 102 graduates with varying degrees with an injury emphasis;
- 50 with a Master's or Ph.D. with an injury emphasis;
- 25 doctoral students with an injury emphasis over 22 years;
- 5-6 students per year doing injury dissertations;
- 31 injury certificates completed in 9 years;
- 150 students annually enrolled in 11 injury courses;
- 100 students annually enrolled in 5 injury courses;
- 10 students over 4 years received intensive injury training; and
- 12 paid research assistants on injury projects over 4 years.

One of the findings from this portfolio evaluation is that the lack of specific categories for training activities and recordkeeping across the centers on training programs presents challenges with evaluating the training efforts of the ICRCs.

The Association of Schools of Public Health (ASPH) surveyed injury prevention and control programs in accredited Schools of Public Health (SPH).[13] Although only eight of the CDC-funded ICRCs were included in the survey, their findings on injury prevention and control student training programs provide valuable insight on the topics covered in injury prevention and control courses. ASPH found that within the 33 SPH that participated in the survey, 163 injury courses were offered, of which 22% (35 courses) focused on teaching the fundamental issues of injury control and prevention both unintentional and intentional. The remaining 128 courses focused on:

- intentional injury/violence-focused courses, which include child maltreatment (22%);
- disaster-focused injuries (natural or man-made/terrorist caused) (23%); and
- other (violence, injury epidemiology, ergonomics, injury biomechanics, disability, kinesiology and recreational injury, injury policy, pediatric injury, adult injury, motor vehicle injury, trauma and emergency, and fire injury) (33%)

Tracking students who participate in center training programs is not a requirement of the ICRC FOA. However, findings showed that many centers have formal and informal methods for both estimating the number of students they have trained and maintaining contact with these students after they have graduated or completed their injury training.

For example, one of the ICRCs developed a student tracking database more than 20 years ago, after receiving its first round of CDC ICRC funding. The database contains students' updated e-

[13] Association of Schools of Public Health. (2004). *Injury Prevention and Control in Accredited Schools of Public Health . 2002-2003 Summary of Research, Faculty Expertise, Curricula, and Training*

mail addresses and other contact information and tracks students' activities and current positions (both nationally and internationally). It also identifies the students' areas of injury research interest and notes their grant funding activity. In addition, Harborview routinely conducts PubMed searches to identify publications by trainees after they have completed the program and inputs this information into the database. This database also is used to maintain contact with alumni, notify them of funding opportunities, and provide a way to assess the ICRC's success in training more than 300 injury researchers who have been awarded more than $114 million in injury-related funding between 1995 and 2008 through the Center.

Finally, a unique aspect of the ICRCs' training programs is the connections the programs make with other departments and schools in the host universities. The centers indicated that this multidisciplinary training promotes the injury prevention and control field among students outside the traditional public health and medical programs and may lead to engineers, sociologists, psychologists, urban planners, and others developing an interest in conducting injury research.

3.3.2 ICRC Faculty and Staff

The evaluation findings suggested that the ICRCs are uniquely positioned to develop mentoring relationships between the centers' seasoned researchers and junior faculty and staff. The ICRC funding provides resources to encourage scholarship and research in injury. The centers also recruit nationally prominent researchers to work in the center and share their knowledge and expertise with other faculty members. In addition, the ICRCs serve as a place where faculty and staff can generate, test, and build on new ideas with insight from injury colleagues. For

example, one Center commented that “leaders' mentorship of rising researchers encourages them [the rising researchers] to enter the injury prevention and control field.” In another example, an ICRC considers relationships between experienced researchers and junior staff to be important to its identity as a center. With support from senior scholars who represent various disciplines, departments, schools, and levels of experience, the center has successfully mentored junior scholars who have gone on to make important contributions to the injury prevention and control field.

3.3.3 Injury Professionals

In addition to training students and ICRC staff to become injury researchers, the centers also help train current injury practitioners and professionals. The evaluation findings suggested that ICRCs train these different groups to raise awareness of injury as a problem, disseminate research findings, and continue to grow the injury prevention and control field.

The following examples illustrate the variety and breadth of training opportunities by the ICRCs for practitioners:

- Conducts Webinars for community organizations, state government officials, and professionals at other universities. To train injury professionals and promote the translation of injury research to practice, emergency medicine physicians offer these Webinars to discuss research findings and best practices. The center has archived 250 Webinars for future viewing.

- Conducted a trauma screening and brief intervention training in collaboration with the

State Department of Transportation. This program was aimed at health-care professionals from all Level I and II trauma centers in Wisconsin. Participants included trauma nurse coordinators, social workers, and others who work in trauma settings. As a result of this training, all nine of the participating trauma centers have adopted at least some components of a set of alcohol screening and brief intervention guidelines. The Injury Research Center at the Medical College of Wisconsin plans to replicate this model with Level III and IV centers across the state in the next several years.

- Provide training for community partners, such as, professionals, parents, school personnel, and other care providers in recognizing the signs of traumatic brain injury in schoolchildren. As a result of its smaller training programs, the center obtained additional CDC funding for a conference to address traumatic brain injury in the communities by linking practitioners to community services. This 2004 conference immediately preceded the State Brain Injury Association Annual Conference and was so well received that the topic has been integrated into the annual conference agenda.

As these examples indicate, the ICRCs' trainings for injury professionals and community members build the injury prevention and control field in two ways: 1) by increasing access to and awareness of CDC-funded injury prevention programs and 2) by ensuring that properly trained professionals are available to prevent and treat injuries.

Conclusion

CDC's ICRC funding is critical to ensuring that the centers have the research infrastructure necessary to build and sustain the injury prevention and control field. The ICRCs use their CDC

funds to leverage additional financial resources from federal agencies and other injury partners. The centers, then, reinvest these resources into infrastructures that promote research, multidisciplinary collaboration, and training of students and professionals.

With this infrastructure in place, the ICRCs can conduct research that results in publications, improved acute care and rehabilitation of injuries, programs and interventions, products and devices, and policy activities that contribute toward improving injury morbidity and mortality. The next chapter describes exactly how the centers have affected the injury prevention and control field by exploring the findings of the second research question: How has the ICRC program affected injury outputs and outcomes?

Chapter 4. Findings: How Has the ICRC Program Affected Injury Outputs and Outcomes?

The second research question that the National Center for Injury Prevention and Control Injury Control Research Center (ICRC) Portfolio Evaluation Team explored was: How has the ICRC program affected injury outputs and outcomes? Findings from the data analyses suggested that the ICRCs' work in building their infrastructure; creating collaborations; and training students, staff, and community members enables them to produce multidisciplinary, cutting-edge research. This research is the foundation on which the injury prevention and control field is built. The findings also suggested that this research leads to outputs such as publications, programs and interventions, improved acute care and rehabilitation of injuries, products and devices, and policy activities and results in improved public health practice and injury outcomes.

4.1 Multidisciplinary Public Health Research and Practice

The portfolio evaluation findings suggested that one way the ICRC program has affected injury outputs and outcomes is by enabling the centers to conduct multidisciplinary, cutting-edge research. This research is the foundation on which the injury prevention and control field is built. Understanding the importance of this output, the ICRC program provides opportunities for world-class researchers to understand and explore injury prevention and control by supplying the necessary infrastructure, collaborations, and trained professionals to

> *"ICRCs can be incubators of research ideas, which is useful in identifying valuable avenues for research and programmatic activities."*
>
> *ICRC Director*

conduct innovative, multidisciplinary public health research and practice. The result of these opportunities is that the ICRCs have produced, by any measure, incredible amounts of injury prevention and control research that lead to improved public health practice.

An example of the research produced by ICRCs is the study conducted from small seed grants. One requirement of the ICRC funding opportunity announcement (FOA) is that the centers use their Centers for Disease Control and Prevention (CDC) grant to award up to $25,000 for small seed grants. The ICRC grants are the only source of funding for seed grants. These seed grants contribute to the multidisciplinary public health research and practice conducted by the ICRCs because they often are the basis for foundational research and larger research projects. As one ICRC director commented, a center "can't do a successful intervention without pilot testing first and there is very little money to pilot test. To leverage any grant in the federal arena, one must have preliminary data, and the ICRC funding facilitates these seed grants that generate that preliminary data."

> *"The seed program can potentially lead to R01 and R21 funding. It will help the center leverage, identify, and bring in faculty members who already have their own funding."*
>
> *ICRC Director*

Public health research is often categorized into four phases: 1) foundational, 2) developmental, 3) intervention and evaluation, and 4) translational. Injury research can be conducted in any of these phases, but a dedicated source of funding and support is typically needed to sustain a research project through all four phases. The ICRC FOA does not require the centers to conduct research that moves through the entire public health research spectrum, and, in fact, some centers have found success in generating foundational research on many topics rather than

continuing to build on one research idea. However, a key finding of this evaluation is that nine of the 12 centers could provide examples of research they had shepherded through all four phases of the public health research spectrum. The following are two examples of research that ICRCs moved through the public health research spectrum:

- Researchers at one ICRC studied whether toy buyers understood warning labels about choking hazards from toys with small parts and, then, worked to change those labels to make them more meaningful to the buyers. The center conducted foundational research, which included surveying toy buyers in a shopping mall, and, then, published their research findings in the *Journal of the American Medical Association (JAMA)*.[14] In addition, the researchers testified at a U.S. Senate hearing about their findings, and, subsequently, the committee report from that hearing relied specifically on the ICRC study. As a result of this research and the testimony to Congress, the law and supporting regulations were changed to require toy manufacturers to use clear, standard language on labels about choking hazards and age appropriateness on all toys with small parts sold in the United States. Changing product labeling and clarifying the prevention message has given parents and other toy buyers better warning about the risks of choking hazards and has, subsequently, reduced the risk of choking among U.S. children.

- Another ICRC used Fatality Analysis Reporting System (FARS) data to show that graduated driver licensing (GDL) interventions, such as the three-step young driver

[14] Langlois JA, Wallen BAR, Teret SP, et al. The impact of specific toy warning labels. *JAMA* 1991; 265(21):2848-2850.

program, reduced fatalities among youth aged 15 to 17 years by at least 5.6%.[15] The ICRC found that more stringent licensing programs proved to be three times more effective than a traditional licensing program. Specifically, GDL programs were associated with a 7.8% reduction in rural traffic fatalities among 15 to 17 year-olds.[11] The most stringent GDL programs are associated with a nearly 22% reduction in this age group.[11] This research demonstrated the effects of state regulations on motor vehicle fatalities for younger drivers. As a result, the State legislature used the findings of the UAB ICRC's graduated license research to enact a state GDL program. This positive outcome was possible because a single source of stable funding allowed ICRC researchers to focus on this topic and move it through the entire public health spectrum.

ICRC researchers have the support and resources necessary to focus on conducting and producing research that builds the injury prevention and control field. Research projects funded in ICRCs benefit from a collaborative, multidisciplinary environment with administrative and research support that enhances the actual research. More importantly, because of the sustained and stable funding, centers also can support post-research activities, such as publications, products, and policy activities. Finally, researchers in ICRCs can often guide a research project through to the translational phase, which may lead to developing policies, improved acute care and rehabilitation of injuries, or programs and interventions that ultimately affect injury morbidity, mortality, and costs.

[15] Grabowski D.C., & Morrisey M.A. The effect of state regulations on motor vehicle fatalities for younger and older drivers: A review and analysis. *Milbank Q* 2001; 79(4): 517–545.

4.2 Publications

The portfolio evaluation findings suggested that another way the ICRCs have affected injury outputs and outcomes is by producing scientific publications. This requirement is a prominent output in both the FOA and implementation logic models. Moreover, because of their location in academic institutions, ICRC researchers are assessed by their host universities and by CDC on their ability to publish in peer-reviewed scientific journals. Being published in these journals builds the reputation and credibility of the centers and their researchers, disseminates ICRC research, and enables an assessment of the significance of the research.

The combination of the centers receiving sustained funding and funding multiple research projects in any given year has resulted in thousands of publications that can be attributed to the ICRCs. The ICRCs reported a total of 4,627 articles in peer-reviewed journals during this time period. **Table 4.1** illustrates the volume of publications produced by researchers at the 12 ICRCs that participated in the portfolio evaluation.

Because of the small number of centers, the evaluation team did not conduct statistical analyses on these data. However, one assessment that the evaluation team did make is that, although those centers with higher numbers of publications have long center histories, a long center history does not guarantee a large volume of publications. The number of publications that a center produces may be affected by the number of seed projects it has funded, the amount of additional funding it has obtained, and its administrative structure, which may be designed to provide editorial support to researchers.

4.2.1 Publications for the General Public

One way injury research projects can be assessed is on their relevance to the general public. Although the ICRC FOAs require centers to publish their research findings in scientific journals, most centers also reported using popular media to bring injury prevention messages to the general public. For example, the centers use their CDC ICRC grants to help fund researchers responding to media requests; participating in news interviews; and developing stories, videos, Web sites, and other materials. The ICRCs, then, share this information with people outside the injury prevention field. Although this work is not required by the FOA, it brings attention to the injury problem and promotes both the ICRCs and CDC.

Table 4.1. Number of publications by category produced by the Centers for Disease Control and Prevention-funded injury control research centers (ICRCs)

ICRC	Years Funded as CDC ICRC	Category of Publication					Time Frame Covered by Publication Counts
		Peer-Reviewed Journal Article	Non-Peer-Reviewed Journal Article	Book	Book Chapter	Technical Report	
Colorado Injury Control Research Center	1995–2008	211	0	0	30	17	1995-2008
Harborview Injury Prevention and Research Center	1987–2008	988	223	8	25	13	1987–2008
Harvard Injury Control Research Center	1987–2006	357	26	7	38	8	1989–2008
Injury Research Center at the Medical College of Wisconsin	2001–2008	127	0	1	9	9	2001–2008
Johns Hopkins Center for Injury Research & Policy	1987–2008	636	N/A	7	N/A	N/A	1994–2008
San Francisco Injury Center for Research and Prevention	1989–2008	92	0	0	27	5	1989–2008
Southern California Injury Prevention Research Center	1989–2008	201	3	8	27	13	1989–2008
University of Alabama at Birmingham, Injury Control Research Center	1989–2008	580	0	25	93	29	1991-2008
University of Iowa Injury Prevention Research Center	1990–2008	529	216	12	55	25	1990–2008
University of North Carolina Injury Prevention Research Center	1987–2008	660	14	11	66	75	1987–2008
University of Pittsburgh Center for Injury Research & Control	1995–2008	181	0	2	26	6	2003–2008
West Virginia University Injury Control Research Center	2004–2008	65	0	1	0	18	2004–2008
TOTAL*		4,627	482	82	396	218	

N/A indicates that the center did not have the data available to report at the time of the interview.
* The total number may reflect duplicate counts of articles from multi-center collaborations.

The following are examples of ICRC communication activities that targeted a nonscientific audience:

- David Hemenway, the director of the Harvard ICRC, used CDC funding and took an 8-month sabbatical to write *While We Were Sleeping: Success Stories in Injury and Violence Prevention*. Published in June 2009, the book intends to promote the injury prevention field. Described as an ode to public health, the book includes 64 documented injury prevention successes and 36 heroes of injury prevention from history, illustrating both programmatic and policy successes. A primary audience for the book is parents of students at public health schools because it may help them better understand the benefits of a career in public health and injury prevention. The Harvard ICRC publicizes the book on its Web site, at the public health school orientation, and on blogs and looks for other innovative ways to promote it.

- One ICRC produced a series of videos on injury prevention targeted at key segments of its state population. For the following topics, the videos describe the public health problem statistically and provide prevention information: all-terrain vehicle (ATV) safety, logging injuries, farmers and the safe use of tractors, and disaster preparedness for older adults. All videos include personal vignettes from individuals who were affected by injury. The center interviewed survivors of an event or injury or talked to family members of individuals who died because of an event or injury. The center found that personal vignettes serve as valuable teaching tools for increasing injury awareness and possibly preventing future injuries.

By using popular media to disseminate injury research, the centers ensure that injury prevention and control is not limited to the scientific community. Through these efforts, among others, the ICRCs reach those people who are likely to be directly affected by injury.

4.2.2 Bibliometric Analysis

Bibliometric analyses partially assess the quality of specific research by analyzing the patterns of citations from research publications. These analyses, when applied to the ICRCs, offer a proxy measure of the impact of the centers' research on the field of injury; the assumption is that publications cited by other researchers are considered valuable, although it is possible that citations critique or identify shortcomings in the research.[16] This bibliometric analysis provides another perspective on the ICRCs contributions to the field of injury prevention and control.

To assess the impact of the ICRCs on the injury prevention and control field, the evaluation team asked each center to submit a list of its 15 most influential publications. To minimize respondent burden and to conserve evaluation resources, the evaluation team asked the ICRCs to submit these 15 publications, rather than a complete list of the centers' publications over the history of the program. The ICRCs were not told that this list would be used for a bibliometric analysis, which is consistent with the protocol followed in past portfolio reviews in which respondents were not told how the lists of publications would be used.

Each center was allowed to define *influential*. For example, some centers identified influential publications as those presenting key findings from an original foundational research project

[16] Borgman, C.L., & Furner, J. (2002). Scholarly Communication and Bibliometrics. In B. Cronin (Ed.), *Annual Review of Information Science and Technology, Vol 36.* Medford, NJ: Information Today, pp 3–72.

that continued to affect the injury prevention and control field. The term *influential* could also be used to describe publications that influenced policy change, evaluated programs, saved lives, or brought new ideas to the field, among others. Some centers also submitted newer publications that the researchers thought would become influential in coming years.[17] (See **Appendix F** for the full list of influential publications submitted by the ICRCs.)

Of the 180 publications submitted, seven were books, 10 were in journals that were not included in the Journal Citation Reports, and 10 articles were not found in the Web of Science® database, thus, resulting in a total of 153 articles available for the bibliometric analysis. The evaluation team conducted a bibliometric analysis on the 153 articles by assessing two factors. First, the team determined the impact of each publication by measuring the number of times it was cited by other researchers. In addition, the team determined the publishing journals' impact factors by using both the Science and Social Science Journal Citation Reports databases in Thomson Reuters' Web of Science.®[18] (**Appendix C** describes in detail the methodology used to conduct the bibliometric analysis.)

Measuring the number of times a specific article has been cited by other researchers suggests the article's influence on the field. Of the publications the ICRCs submitted, though, 22 were published in 2008, one in 2009, and three were in press, suggesting that these publications may

[17] Nine ICRCs included a total of 74 books and reports to their lists of most influential publications. These publications are critical to the injury prevention and control field; however, they were excluded from the formal bibliometric analysis because they were not published in peer-reviewed journals.

[18] As of this writing, impact factors were only available from Web of Science for 1997 through 2007. For science journal articles published before 2002, the earliest year included in the Science Journal Citations Report database, the evaluation team defaulted to the 2002 journal impact factor. For social science journal articles published before 2003, the earliest year included in the Social Science Journal Citations Report database, the team defaulted to the 2003 journal impact factor

be too new to have been cited many times. However, an article by one ICRC—"Increased Police Patrols for Preventing Alcohol-Impaired Driving"—published in 2008 in *Cochrane Database of Systematic Reviews* showed a relatively high impact factor (4.654). Even though the research was published recently, the high impact factor suggests that it is already having an influence on the field.

The evaluation team found that, for the 153 articles for which times cited information was available, the number of citations per article ranged from 0 to 431, with an average number of 26.4. Overall, these publications were cited 4,753 times over the course of 24 years. The article most often cited was "Cerebral Perfusion Pressure: Management Protocol and Clinical Results," published by M. Rosner and S. Rosner at one the ICRCs; it was cited 431 times since its publication in the *Journal of Neurosurgery* in 1995. The second most-cited publication was an ICRC article written by J.M. Abbot et al., "Domestic Violence against Women: Incidence and Prevalence in an Emergency Department Population"; it was cited 331 times since its publication in *JAMA* in 1995.

This analysis also assessed the relative influence, or impact factor, of the science and social science journals in which the ICRCs published their research. These journals included the *New England Journal of Medicine*, *JAMA*, *Accident Analysis and Prevention*, *American Journal of Preventive Medicine*, *Pediatrics*, and *Neurosurgery*. A journal's impact factor is considered the measure of its influence, and the higher the measure, the more influential the journal. The impact factor is calculated from annually assessing measures such as the distribution of the journal and the number of times that the journal is cited. The impact factor database only

includes publications from 2002 through 2008. If an article an ICRC submitted was published before 2002, the evaluation team used the 2002 date to estimate the impact factor.

The average impact factor of the 153 articles for which the journals' impact factors were available was 5.173. The impact factors for these journals ranged from 0.706 (the *Journal of Interpersonal Violence* in 2004) to 51.296 (the *New England Journal of Medicine* in 2006). The article "A National Evaluation of the Trauma-Center Care on Mortality," published in 2006 in the *New England Journal of Medicine* by researchers from two ICRCs, had the highest journal impact factor (51.296). Based on the list of the 15 most influential articles submitted by the centers, the journal in which the ICRCs published most frequently was *JAMA*, which had a journal impact factor of 16.586. Eight centers reported 10 publications in *JAMA.*

Some limitations of bibliometric measures are that they are not always comparable across fields, programs, or countries and they may be susceptible to bias and artificial influences. For example, the measures used to determine the impact factor of a publication are influenced by reviewers' individual perceptions of a journal. Credible journals such as *JAMA* generally are perceived as high quality, even though they occasionally may publish subpar articles. Conversely, a new journal may publish excellent articles but may not have built its reputation yet, so the journal's impact factor may not be high enough to reflect its contribution to the field. Despite these limitations, the times-cited and publication impact factors provide indirect measures of the usefulness and quality of the ICRC's research.

4.3 Acute Care and Rehabilitation of Injuries

The portfolio evaluation findings suggested that another way the ICRCs have affected injury outputs and outcomes is by their work in acute care and rehabilitation of injuries. The ICRCs' connections with hospitals and trauma centers and their multidisciplinary partnerships facilitate the development, testing, and dissemination of new methods for acute care and rehabilitation of injuries. In developing and testing new treatments, the ICRCs directly address the short-term goal of improving the acute care and rehabilitation of injuries.

The following are examples of methods developed by the ICRCs to improve acute care and rehabilitation of injuries:

- Developed a clinical decision rule for emergency department clinicians to use in evaluating children younger than 2 years old who present with nondescript symptoms. These symptoms can be a sign of inflicted traumatic brain injury (iTBI), which is the leading cause of death from brain injury in infants and young children. Preliminary data in children show that serum levels of specific biomarkers are sensitive indicators of both inflicted and noninflicted TBI. Although a positive serum biomarker level does not imply child abuse, a positive test would suggest the presence of brain injury and the need for further evaluation. If successful, these ICRC-developed guidelines could potentially reduce the misdiagnoses of iTBI and, ultimately, prevent severe or fatal re-injury among infants with previous brain injuries. The ICRC currently is testing this protocol with emergency room (ER) physicians. After publishing the research, the investigators will

determine the best way to encourage adoption of the decision rule as standard ER protocol.

- Explored the use of ultrasound to diagnose internal injuries. This treatment enables medical providers to diagnose internal injuries more quickly and efficiently, thereby reducing injury mortality.

Although the examples above showcase acute care and rehabilitation of injuries in a clinical setting, the ICRCs also examine ways to improve acute care and rehabilitation of injuries outside of clinical settings. For example, centers may research care and rehabilitation within athletic training programs, in domestic violence situations, in rape crisis or mental health centers, and in the course of emergency medical services delivery.

4.4 Programs and Interventions

Another way that the evaluation findings suggested the ICRCs have affected injury outputs and outcomes is by developing injury programs and interventions. The ICRCs are in a unique position to develop, implement, and test programs and interventions designed to modify behavior. Although foundational research can be conducted by individual researchers, researchers who are part of a center have access to communities where they can conduct outreach and implement interventions. ICRCs are on the front line of dissemination research and are well positioned to work with their communities to implement evidence-based injury prevention activities that promote widespread practice. These programs and interventions are one way the ICRCs work to reduce injury-related morbidity and mortality.

For example, an ICRC created and evaluated the concept of hospital-based and community-based children's safety resource centers. The centers provide a place for families to receive free personalized education, low-cost safety products, and in some cases, referral and counseling by physicians. The hospital-based children's safety center model has been widely disseminated by Center researchers and is currently implemented in at least a dozen children's hospitals throughout the United States. Center faculty worked with the National Association of Children's Hospitals and Related Institutions (NACHRI) to promote the establishment of these resource centers by developing and disseminating a Children's Safety Resource Center replication guide and by providing technical assistance. (For more examples of programs and interventions, see the success stories in Appendix B and examples of outreach to local communities in Appendix G.)

4.5 Outreach--Products and Devices

The portfolio evaluation findings suggested that another way the ICRCs have affected injury outputs and outcomes is the development of products and devices. Many of the ICRCs' research activities result in products and devices for use in clinical, academic, and community settings. These products include scientific tools, such as training curricula and public health applications and interventions. They also include injury prevention and control devices, such as hip pads to protect older adults from injuries related to falls and car doors designed to prevent injury to drivers and passengers.

One example of an ICRC-produced scientific tool is the quality-of-life screening instrument. This instrument can be used to improve the care of trauma patients and is being tested with

patients at the Level I adult trauma center. The researcher's initial investigation has led to an increased awareness of the importance of post-traumatic stress disorder (PTSD) in both the recovery as well as long-term quality of life trauma patients, and several of the patients in her focus groups have expressed interest in support groups or further contact with mental health professionals. These findings will be used from this initial testing to recommend treatment changes that will improve patient care in the trauma setting.

In addition to scientific instruments, ICRCs' research often leads to the development of curricula that can be used to train injury research professionals. For example, several ICRCs collaborated with other injury prevention organizations to recommend a set of core competencies that are fundamental to injury and violence prevention practice. These competencies reflect essential skills and knowledge for working in injury and violence prevention. They can guide professional development, including future training and curriculum efforts. By developing a curriculum focused on research-based training and consistent implementation of best practices, the centers are working to reduce the burden of injury.

An example of ICRC-created training is the simulation training. This training allows trauma medical residents to practice their skills on simulated patients in trauma care settings. These simulated patients, who resemble crash-test dummies and have functioning body parts, are designed to mimic real trauma patients. This training program is required for student residents at the trauma center associated with the ICRC. However, the center's injury researchers have also worked to get the training program adopted nationally, which will improve the training of trauma residents and, ultimately, the care of trauma survivors.

Many ICRCs also create products that can be used to prevent injuries. For example, an ICRC conducted foundational research that was used by center researchers to develop and test new designs and prototypes for bicycle and motorcycle helmets. The ICRC's long-term goal is to use these helmets to conduct more complex research in head and neck injuries. Because of the ICRC's work in developing the helmets, the Consumer Product Safety Commission retained the center researchers to validate the pediatric helmet standard and assist CPSC in preparing responses to comments in the Code of Federal Regulations.

The ICRCs also develop products for global audiences that have far-reaching effects. For example, during a survey on child discipline an ICRC convened 100 scientists from 31 countries to develop child abuse screening tools, which the World Health Organization now promotes globally. The center also developed a series of questions about child discipline practices that has been added to a UNICEF survey for physicians. Forty-five countries currently use these questions for generating the best available data on different forms of child discipline.

4.6 Policy Activities

The evaluation findings indicate that the ICRCs also work to improve injury outputs and outcomes by contributing to policy activities. Policy is important because it can be used to create population-based change. Understanding the importance of policy, the centers are key to affecting policy activities at the private, local, state, tribal, and national levels and they provide critical resources and/or expertise to bridge the gap between research and practice.

The public health and injury prevention research conducted by the ICRCs provides the necessary data for developing effective public health policy. Such policies include laws on

bicycle helmets, motorcycle helmets, booster seats, and seat-belt use. Although many ICRCs are prohibited from lobbying, they can review injury and cost data and provide objective analyses to their state legislatures. Policy makers then review the data and decide appropriate policies for reducing injury morbidity and mortality.

For this evaluation, each center reported one policy activity for which it had disseminated research data to bring about policy change. In addition to disseminating research data, the centers also provided testimony, legislation writing assistance, op-ed articles, risk assessments, technical reports, videos, and technical assistance to other states. ICRC researchers provided policy information primarily to state legislators, though some of the policy information was used by the general public. In one case, policy information was provided to the U.S. Coast Guard, which sought consultation on its merchant marine alcohol policy.

The following is an example of policy activity at one ICRC.

- An influential ICRC policy activity of one Center's work was the establishment of an alcohol screening and brief intervention (SBI) requirement for the American College of Surgeons. This requirement ensures that all Level 1 trauma centers conduct alcohol SBI on all of their patients. This policy is successful in part because of the formative research conducted at one ICRC that established alcohol use as a critical risk factor for trauma and series of studies conducted since 1999 showing that brief interventions reduce alcohol consumption, subsequent alcohol-related injury and provide cost-effective care. The cost-effectiveness study showed a cost saving of $3.81 for every $1 spent on an alcohol screening and brief intervention (SBI).

Examples of the ICRCs' influence on policy activities at the national level:

- Provided state legislators with data on ATV injuries based on injury research conducted at the ICRC. These data were used to pass a state law in March 2004 to guide and protect ATV riders. However, additional research revealed that passage of this bill resulted in an unintended consequence: It opened up many miles of public, paved roads for ATV use, which is contrary to the design intent of ATVs. Now, half of all ATV-related injuries and deaths occur on paved surfaces. The ICRC is currently working with state legislators to enact additional legislation. This legislation would further limit ATV use to specific locations and trails and would strengthen the helmet requirement so that all riders, not just those younger than 18 years, are required to wear a helmet.
- Produced *Workplace Violence: A Report to the Nation* in 2001. This report resulted from a workshop that brought together experts from industry, labor, academia, and the government to study workplace violence and more clearly define the scope of the problem. The report ultimately led to a federal initiative on workplace violence prevention.
- Provided data necessary to develop policies related to fire safe cigarettes. Affiliates of one ICRC published research in the American College of Surgeons Bulletin that served as a model policy for fire safe cigarettes and led the effort to promote fire safe cigarettes nationwide for more than two decades. Adding to this work, another ICRC conducted further epidemiologic research in another state on fires and used this research, along with the previous mentioned ICRC , to advocate for a state law requiring that, by 2010, all cigarettes sold in must be self-extinguishing. Upon passage of the law, R.J. Reynolds

announced that it would produce only fire-safe cigarettes. Twenty-one states have passed fire-safe cigarette legislation and 81.5% of the U.S. population is now or soon will be at a reduced risk from cigarette fires because of fire-safe cigarette legislation.

Conclusion

The portfolio evaluation findings suggested that the ICRCs have affected injury outputs and outcomes by producing multidisciplinary research. This research leads to outputs, such as publications, improvements in acute care and rehabilitation of injuries, programs and interventions, products and devices, and policy activities that may result in improved public health practice and injury outcomes. The ICRCs' sustained funding as centers creates a stable environment that contributes to the production of this research and that promotes long-term commitment to specific research topics. Over time, research can move across the public health research spectrum and lead to achieving longer term outcomes, such as behavior modification and policy changes in the private and public sector. CDC's ICRC funding is the one of the few funding sources that encourages researchers to apply their research outputs and outcomes with the general public and various injury partners, including policy makers, safety organizations, hospitals, companies in the private sector, federal agencies, and global multilateral organizations.

With a solid infrastructure in place, the ICRCs are conducting research that results in products and activities that contribute to improving injury morbidity and mortality. What, though, is the overall value of the ICRC program and its activities? The next chapter explores this question as

it discusses the findings of the third research question: What is the value of the ICRC portfolio, and what is the advantage of the ICRC program versus individual researcher grants?

Chapter 5. Findings: What Is the Value of the ICRC Portfolio, and What Is the Advantage of the ICRC Program Versus Individual Researcher Grants?

The third research question that the National Center for Injury Prevention and Control (NCIPC) Injury Control Research Center (ICRC) Portfolio Evaluation Team explored was: What is the value of the ICRC portfolio, and what is the advantage of the ICRC program versus individual researcher grants? Thus far, this evaluation has identified how the ICRC program has built the injury prevention and control field and the centers' effect on injury outputs and outcomes. Specifically, Chapters 3 and 4 have detailed how the Centers for Disease Control and Prevention (CDC)'s ICRC funding enables the centers to build the necessary infrastructure to produce the research, outcomes, and outputs that are critical to building and sustaining the injury prevention and control field. However, CDC, as the funder of the ICRC program, ultimately wants to know the value of the portfolio and the advantage of funding a program instead of individual researcher grants.

This evaluation revealed that the ICRC program provides value to CDC and the injury prevention and control field through a wide range of benefits beyond the centers' infrastructure, collaborations, training programs, and research. These program benefits include outreach to local and global communities, connections to policy makers, greater exposure of researchers outside CDC to the public health approach in injury prevention research, and trained injury researchers. The evaluation also found that the advantage of funding an ICRC portfolio is that these program-produced benefits could not be gained through funding to individual

researchers. Also of critical importance is that these benefits are not attainable through other injury funding mechanisms.

5.1 ICRC Portfolio Value

The portfolio evaluation suggested that the ICRC program provides value to CDC and beyond through a number of benefits. These benefits include outreach to local and global communities, connections to policy makers, greater exposure of researchers outside CDC to the public health approach in injury prevention research, more visibility for CDC, trained injury researchers, and leverage of ICRC funds for additional funding.

5.1.1 Outreach to Local and Global Communities

One way the portfolio evaluation suggested that the ICRC program provides value is the program's outreach to local and global communities. The ICRC program sustains several fundamental areas of the injury research field at the local and global levels.

At the local level, the centers provide their communities with injury prevention programs and interventions, technical assistance/training, and service on advisory boards. The strong relationships between ICRC researchers and community members enable centers to promote both injury research and practice. Through the ICRCs, researchers have access to communities where they can conduct outreach and interventions. Because centers are on the front line of dissemination research, they are well positioned to work with their communities to implement evidence-based injury prevention activities that promote widespread practice.

In addition to promoting injury research and practice, ICRCs consider service to the community to be a key component of their work; in fact, the portfolio evaluation findings indicated that all 12 centers evaluated are involved in some type of service activity. ICRC grants are one of the few sources of funding that cover these activities, which include consultations and technical assistance/training to community and regional groups. Consultation typically involves the centers participating in advisory roles on boards or committees in community settings. Technical assistance includes the centers providing specific training, education, or guidance on a defined topic. Although the centers value the ability to provide these services, they struggle to balance the resources dedicated to conducting service activities with the resources dedicated to conducting research. (See Appendix G for examples of this outreach to local communities.)

In addition to their outreach to local communities, the ICRCs affect the global community through a wide range of trainings and resources they provide internationally. One example of global training is where an ICRC used technology to create a virtual classroom. Three of the six core injury courses are taught on a global campus, with participants from 26 countries. The ICRC also has a Fogarty injury program, which annually sponsors three to five trainees from central and southeastern Europe to study in the United States and supports a summer institute for training in partner countries.

Another example of ICRC global collaboration is another ICRC's support for updates of systematic reviews on smoke alarm promotion and school-based violence prevention programs. These reviews have provided key evidence for policies developed by a wide range of

organizations, including state health departments, professional societies, nonprofit organizations such as Safe Kids Canada, and international agencies, such as the New Zealand Fire Service, the Department of Human Services of the State Government of Victoria, Australia, the Public Health Institute of Scotland, the World Health Organization's Regional Office for Europe, and the World Bank's Disease Control Priorities Project. (See Appendix H for more examples of this global work.)

Since the ICRC grants cannot be used for international work directly, the centers are able to leverage other resources to support this work. The centers' successful outreach to global communities therefore, is additional evidence the value provided by the ICRC program.

5.1.2 Connections to Policy Makers

Another way the portfolio evaluation suggested that the ICRC program provides value is the program's connections to policy makers. Through their work, the centers can connect with numerous local, state, tribal, and federal legislators; policy makers; and elected officials. In doing so, the ICRCs serve as a source of injury prevention data, contribute to policy change, and are important advocates for injury control. The interaction between policy makers and center staff is highly valuable in affecting population-level changes related to injuries. In addition to population-level changes, CDC can advance the field of injury prevention and control through the centers' interactions with policy makers at the state, tribal, and local levels, according to the ICRC directors. This influence on policy produces tangible results, as demonstrated by the centers' work supporting state injury prevention policies such as helmet and seat-belt laws.

5.1.3 Exposure to Public Health Prevention and Control and CDC Visibility

The ICRC program also provides value by exposing researchers outside CDC to public health prevention and control and by making CDC more visible. For example, by exposing researchers outside CDC to the public health approach to injury prevention and control, the ICRC program provides a prevention perspective that complements the medical/treatment framework under which many other funders operate. The exposure to injury prevention enables researchers to develop a prevention-based perspective in which injury is addressed by using a comprehensive approach. This exposure to the public health approach raises awareness of injury prevention and control methods, influences future research, and potentially leads to population-level changes such as legislation, regulations, and other policy changes.

ICRCs also noted that their programs offer CDC increased visibility, acknowledgment, and promotion in the injury prevention and control field. CDC staff reflected that the agency gains credibility by funding well-known institutions with prestigious researchers.

5.1.4 Trained Researchers

Another way the portfolio evaluation suggested that the ICRC program provides value is the program's training of researchers. Although section 3.3 described the ICRCs' training activities, this section discusses the value of these training activities to CDC and the injury prevention and control field. This contribution is important because students, researchers, and practitioners trained by the ICRCs may become employees of CDC, serve on injury prevention and control field committees and review teams, and consult with CDC on specific research areas. According to James Mercy, the special advisor for strategic directions of the Division of Violence

Prevention at NCIPC, the "centers are ideally situated to provide training because they are composed of the leading injury researchers in the country and, in many cases, the world, and they bring their knowledge and expertise to the new generation of researchers." Through this work, the centers fulfill a primary criterion in the ICRC program by providing the foundation for sustained training of injury students, researchers, and practitioners.

As evidence of successful training and leadership from the ICRC program, several current center directors trained as injury researchers at ICRCs. For example, the Johns Hopkins Center for Injury Research and Policy trained Carol Runyan who now directs the University of North Carolina (UNC) at Chapel Hill's Injury Prevention Research Center. Another is Beth Ebel, director at the Harborview Injury Prevention and Research Center, who trained at the Harborview center before becoming its director in 2007. Four researchers with the Harborview Injury Prevention and Research Center have held leadership positions at that ICRC, including David Grossman (former director), Charles Mock (former director) and Monica Vavilala (current associate director). Furthermore, Carolyn DiGuiseppi, current associate director for research for the Colorado Injury Control Research Center, also trained at the Harborview Injury Prevention and Research Center.

In addition to ICRCs training their future leaders, the evaluation found that the centers promote an intergenerational cadre of injury researchers at ICRCs because the program has existed for more than 20 years. For example, the University of Iowa Injury Prevention Research Center Director Corinne Peek-Asa, who trained at the Southern California Injury Prevention Research Center, has recruited two injury researchers for the Iowa center from other ICRCs. One of these

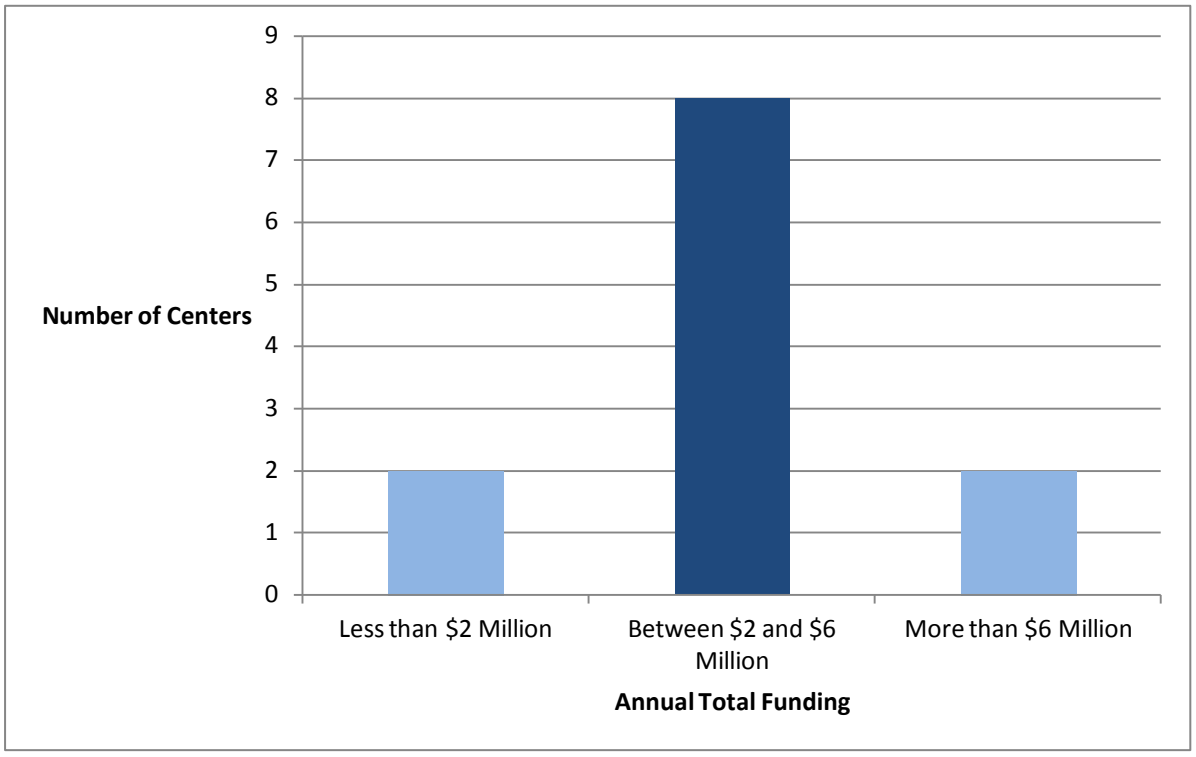
researchers is junior researcher Marizen Ramirez, a graduate of the University of California, Los Angeles, School of Public Health and, formerly, a researcher with the Southern California Injury Prevention Research Center. The other researcher is Jingzhen (Ginger) Yang, a graduate of the University of North Carolina (UNC) at Chapel Hill, and, formerly, a researcher with the UNC Injury Prevention Research Center. This example demonstrates how the ICRC program has created and fostered collaboration among three generations of injury leaders and researchers.

5.1.5 Ability to Leverage Funding

Finally, the ICRC portfolio provides value by allowing the centers to leverage their ICRC grants for additional funding. Section 3.1.5 described how the centers leverage the ICRC grants to raise additional dollars. This section describes how CDC benefits from the centers' ability to leverage funds.

Funding for the ICRC program has been relatively level since 2000, with each center receiving nearly $900,000 annually; however, all the centers have used their CDC ICRC grants to leverage other resources. In fact, the evaluation found that, for every dollar CDC invests in the ICRCs, the centers can raise an additional $1 to $7 million from other sources. For example, from 2005 to 2008, two centers had an average total annual funding amount of less than $2 million, eight centers had an amount between $2 million and $6 million, and two centers had an amount of more than $6 million (**Figure 5.1**). A wide range of federal, state, and private sources, including foundations and trade associations, provided these additional dollars.

Figure 5.1. Average Annual Total Funding for Injury Control Research Centers from 2005–2008



The amount of additional funding the centers gain varies greatly and does not seem to be associated with the length of time the center has received CDC ICRC funding. Possible explanations for the differences include variance among the centers in how R01 and other grants obtained by individual researchers are accounted for, university environments that reward grant writing, availability of seasoned researchers who can mentor junior staff in obtaining additional funding, and administrative structures that support researchers in writing and managing grants.

The additional funds that centers obtain directly support injury research conducted by ICRC scientists. Although obtaining extra funding is not required by CDC, these additional funds

forward the missions of the ICRCs and contribute to CDC's mission to prevent injury morbidity, mortality, and costs.

5.2 ICRC Portfolio Advantage Versus Individual Grants

In addition to finding value in the ICRC program, the portfolio evaluation found that the advantage of CDC funding the ICRC portfolio is that the program-produced benefits mentioned above could not be gained through funding to individual researchers. Also of critical importance is that these benefits are not attainable through other injury funding mechanisms.

CDC's use of a center funding mechanism versus one that funds an individual researcher ensures that the ICRCs can use their grants to cover the costs associated with developing and sustaining center research. As opposed to R01 grants that provide funds to discrete, specified, circumscribed research projects, the ICRC program grants provide funds for "integrated, multi-project research that involves a number of independent investigators who share knowledge and common resources."[19] These center grants encourage collaboration, provide access to resources, build infrastructure, and provide stability to researchers to move an injury research topic through the entire public health research spectrum—from foundational to translation. The center creates an environment in which individually funded researchers (R01, P01, etc.) can take advantage of the ICRC resources to support their research. The R01 researchers also benefit from the multidisciplinary, collaborative environment of the center and the resources available to facilitate the dissemination of their research. Ultimately, research conducted in a

[19] NIH, Office of Extramural Research, Types of Grant Programs, accessed July 2, 2009: http://grants.nih.gov/grants/funding/funding_program.htm#RSeries.

stable center environment may yield outputs and outcomes that affect and reach the general population.

In addition, according to the ICRCs, CDC grant dollars are a critical, unique component in developing, supporting, and maintaining the centers' infrastructure that enables this research. The centers referred to CDC funding as the "glue" that brings center staff together and creates the foundation upon which the injury research field is built. As one center commented during its interview, "There is no other source of research dollars like ICRC funding, which is key to building the field of injury and violence prevention and providing valuable resources for infrastructure support." A sustainable infrastructure that helps build and maintain the injury prevention and control field requires much time to develop and a dedicated funding source. CDC's ICRC grants have served as this stable source of funding for many of the centers over the last 20 years.

5.3 Future ICRC Research Directions

The review of past ICRC achievements is one approach to assessing the value of the ICRC program. For identifying programmatic gaps and future contributions to the injury prevention and control field, the evaluation team sought information on the ICRCs' future research. The next few pages describe the ICRCs' key research priorities for the next 5–10 years, which were reported to CDC during this evaluation. These are examples of research topics that the centers may address and are not a summation of all future ICRC research directions. The centers will continue to respond to regional, state and national needs as well as research gaps in the injury prevention and control field.

The ICRCs have varied plans for future research. Six centers mentioned violence prevention as a topical area for future research. Their specific foci will include youth violence, domestic violence, interpersonal violence, and suicide. Three centers intend to conduct research in the acute care arena. Of those, one center will focus on injury and alcohol and another will focus on the effects of trauma on children and the elderly. Two centers plan to conduct sports and recreation research. One will concentrate on leisure activities, and the other will focus on obesity, physical activity, and injury.

Two centers will address poisoning in their future research. The ICRC noted, "Poisoning is now the leading cause of death in their state. In response to an overwhelming number of poisonings in the region, state, and nationally, the center is getting more involved in poisoning issues. The center is working with the State Department of Public Health to develop surveillance for overdose deaths." The center also participates in national workgroups on poisoning, is helping to plan a national forum on opioid overdose deaths, and is conducting research on the safety of opioid prescribing. Other evolving research areas include traumatic brain injury, disaster mitigation and preparedness, and consumer product safety. Centers also indicated that they would pursue pharmacoepidemiologic studies, policy and cost analysis research, and injury technology research, such as simulation work.

Of particular importance to some CDC staff who participated in this evaluation is the potential for future research on global issues. One staff person commented that CDC is ideally positioned to ensure that best injury practices are adopted on a more global scale, and another staff member noted that the ICRCs are well positioned to make a tremendous contribution to the

global injury problem. According to Mark Rosenberg, former director of NCIPC, "CDC has incredible resources that could be brought to bear at every point of the research spectrum. The ICRCs could make an important contribution, but CDC needs to have appropriated and allocate resources to the ICRCs to conduct this much needed injury research and capacity building internationally."

The centers also identified populations they intend to target in future research. These groups include older adults and the aging population, rural populations, immigrant populations, and vulnerable populations. Several centers also indicated that they will increase their focus on intervention research, evaluation research, translation of scientific evidence into policies and programs, and clinical dissemination of effective interventions.

This information on the ICRCs' research priorities for the next 5–10 years opens the door for CDC to work closely with the centers and possibly align ICRC funding opportunity announcements (FOAs) to address some of the research topics. CDC can also use this information to provide technical assistance and other resources to maximize the contributions of the ICRCs to the field of injury prevention and control.

Conclusion

The portfolio evaluation found that the ICRC program is creating value through benefits such as outreach to local and global communities, connections to policy makers, greater exposure of researchers outside CDC to the public health approach in injury prevention research, and trained injury researchers. For example, through interactions with injury partners at the local, state, tribal, national, and global levels, the ICRC program has produced multidisciplinary

research that addresses expected outcomes identified in the FOA logic model as well as longer term injury outcomes, such as public and private sector policies. In addition, establishing a viable training program to train injury researchers and practitioners addresses one of the key reasons for the creation of the ICRC program. Also, because it has existed for more than 20 years, the ICRC program currently has three generations of researchers that collaborate and leaders that head CDC-funded ICRCs. Finally, the ICRC program provides a solid return on investment for CDC, which is an important benefit not originally required by the grant but a valuable asset, nonetheless, to the federal government.

In addition to finding value in the ICRC program, the evaluation found that the advantage of funding the ICRC portfolio is that these program-produced benefits could not be gained through funding to individual researchers. One important value of the ICRC portfolio is the collective contribution and reach of the ICRCs, as a group, to injury prevention and control.

The next chapter synthesizes the results of this third research question with the other two questions' results to determine the evaluation's overall goal—whether the ICRC program has been valuable to CDC-NCIPC's mission to address injury prevention and control.

Chapter 6. Discussion

The National Center for Injury Prevention and Control (NCIPC) Injury Control Research Center (ICRC) Portfolio Evaluation conducted between 2007 and 2009 was the first systematic assessment of the relevance, quality, and significance of the ICRC program. To determine whether the ICRC program has been valuable to the Centers for Disease Control and Prevention (CDC)'s mission to address injury prevention and control, the evaluation team posed three research questions:

1) How has the ICRC program built the injury prevention and control field?
2) How has the ICRC program affected injury outputs and outcomes?
3) What is the value of the ICRC portfolio, and what is the advantage of the ICRC program versus individual researcher grants?

Based on the overwhelmingly positive findings to the above research questions, the evaluation team offers that the ICRC portfolio is a valuable program that contributes tremendously to CDC's injury prevention and control mission at the local, state, tribal, federal, and global levels. This chapter discusses the findings from the three research questions and offers some reflections on the program that may be useful for NCIPC leadership and program staff, ICRC directors and staff, and other CDC programs seeking to establish and evaluate research center programs. The evaluation's limitations and possible future evaluations of the ICRC portfolio are also discussed.

6.1 Synthesis of Findings from Three Research Questions

As the findings from the three research questions suggest, the ICRC program has helped to build the injury prevention and control field's research foundation, positively affected injury outputs and outcomes, and provided value to CDC and the injury prevention and control field beyond the requirements of the ICRC grant. At the infrastructural level, the centers conduct support activities, collaborations, and training programs that provide a productive setting and support for promoting multidisciplinary public health research and practice. The training, in particular, is a unique characteristic of the ICRC grant that does not exist in most other research grants. In fact, because of the long history of ICRC training funding, some centers have several generations of injury researchers who collaborate with one another. Today, CDC and the ICRC program can boast of over 20 years of mentoring students and professionals who have become researchers or practitioners focusing on injury and who provide injury consultation and technical assistance across the field.

In addition, CDC has received a large return on investment (ROI) from the ICRC program. For example, the ICRCs leverage their CDC grants to obtain additional funds from other organizations, which has created a sustainable foundation for innovative work that contributes to important injury outcomes such as behavioral modifications and policy changes. Attributing such changes solely to the ICRC grant and the work of the centers is difficult. However, the evaluation team suggests that these outputs and outcomes, over time, have contributed to ultimate goals such as changes in injury morbidity and mortality and reductions in injury costs.

Another major finding in this evaluation is that the ICRCs' center-status creates a stable environment that promotes long-term commitment to and movement through the public health research spectrum. Over time, researchers affiliated with ICRCs may take advantage of the center support and environment for collaboration to move some research topics from bench science to translation and finally to practice. This finding is consistent with similar findings related to a multidisciplinary research environment and collaboration as discussed in The Institute of Medicine's report, *NIH Extramural Research Center Programs: Criteria for Initiation and Evaluation*.[20]

ICRC researchers are also encouraged to collaborate with broad domestic and global partners, including other ICRCs, on research and to share research data and tools, findings, programs, and interventions with the field. Ultimately, this collaboration reinforces the multidisciplinary public health research and practice that contribute to longer term injury outcomes and grows the field of injury prevention and control.

Because the findings suggest that the ICRC program has contributed so positively to building the injury prevention and control field's research foundation, to positively affecting injury outputs and outcomes, and to offering value to injury researchers and professionals beyond the requirements of the ICRC grant, the evaluation team recommends that the program is a valuable asset to CDC's injury prevention and control mission. CDC should continue to encourage and support the ICRCs' efforts at the local, state, tribal, federal, and global levels so that the centers remain strong and successful CDC partners poised for future growth in injury

[20] National Academy of Sciences. *NIH Extramural Center Programs: Criteria for Initiation and Evaluation*. National Academies Press, Washington, D.C., 2004.

prevention and control. Chapter 8 details the external peer review panel's concrete recommendations to strengthen and promote the future development of the ICRCs and the ICRC program.

6.2 Limitations

The results, though overwhelmingly positive, are restricted by several limitations that the evaluation team identified in this study. First, this evaluation report describes the ICRCs' contributions to expected outputs and outcomes but does not attribute changes to ultimate health goals to the efforts of the ICRC program alone. CDC's ICRC grant is only a portion of the total funding that the ICRCs receive to carry out their center missions, and, therefore, any impact they may have on injury outcomes cannot be attributed solely to the efforts of the ICRC program alone.

Second, the evaluation focused on identifying components and examples from the ICRC program that characterize its overall contribution to the field of injury research. Because of this approach, the evaluation should not be considered an inventory of each center's activities, projects, and services over the course of the ICRC program. This evaluation also does not adequately represent the idea of synergy that many of the centers alluded to as a hallmark of their work. The center directors used the term *synergy* to describe the interplay and interrelationship among all of the activities they conduct as centers, which they describe as only occurring within a research center. *Synergy* with in a research center has been identified as a

value-added in other center evaluations as well, but the measurement of such intangibles has posed a similar challenge.[21]

Third, the exploratory approach used in the study allowed the ICRCs to uniquely define terms such as *training* and *funding*. Where possible, the evaluation team sought to standardize the definitions of terms for data collection, but frequently, centers did not have the data to answer a question as defined by the evaluators. Hence, these definitional differences prevented the collection of robust quantitative data for certain components, such as funding and training.

Finally, one of the goals of the evaluation was to highlight successes and challenges faced by the centers that could be addressed through program improvement. Given this goal, the ICRCs provided feedback on their center accomplishments and challenges during the various stages of data collection.

6.3 Future Evaluation Directions

Future portfolio evaluations of the ICRC program may seek to systematically compare the ICRC program with individual investigator grants to increase the understanding of center dynamics and the value-add of center research. Findings from such an evaluation may guide CDC and other research funders to focus resources on those programs that best promote innovation and the movement of research to practice.

Also, a future evaluation that seeks to include more quantitative measures of training activities would benefit from a dialogue among CDC, the ICRCs, and other major public health and

[21] National Academy of Sciences. *NIH Extramural Center Programs: Criteria for Initiation and Evaluation*. National Academies Press, Washington, D.C., 2004.

medical partners to standardize the definition of an injury major or concentration. The consensus definition that emerges from this discussion would facilitate the quantification of training, including the number of injury students and professionals that the ICRCs produce each year.

Finally, future evaluations should seek to quantify and better understand the types of publications that the ICRCs produce. One way of facilitating this study would be to house at CDC or at one of the centers a central database containing all ICRC publications, which publically could be available to researchers and evaluators.

Conclusion

In conclusion, for more than 20 years, the ICRC program has been a valuable asset to CDC and the field of injury prevention and control. As a key partner of CDC, the ICRCs both must maintain their research foundation and have the flexibility to change with the needs of the injury prevention and control field. The next chapter discusses challenges, observations, and recommendations for the ICRC program from three groups of participants in the portfolio evaluation and review: ICRC directors and staff, current and former CDC staff, and external peer reviewers from the ICRC Portfolio Evaluation External Peer Review Panel Meeting that convened on November 3–4, 2009.

Chapter 7. Challenges and Observations

This evaluation has demonstrated that the National Center for Injury Prevention and Control (NCIPC) Injury Control Research Center (ICRC) program is valuable to the Centers for Disease Control and Prevention (CDC)'s injury control and prevention mission. Despite an overwhelmingly positive assessment, however, the ICRC program could be improved in several ways to increase its usefulness to the injury prevention and control field. This chapter discusses challenges and observations identified by ICRC directors and staff and CDC staff. This chapter also preliminarily identifies research and programmatic gaps and foci for guiding NCIPC policy, funding, and staffing decisions.

The ICRC directors and CDC staff members who work with the ICRC program are uniquely qualified to report on challenges and observations related to program improvements because of their intimate involvement with the program. They identified challenges associated with increasing collaboration, improving training programs, increasing funding, and improving the program structure and management. Although CDC has a limited ability to address some of these challenges, CDC's understanding of the context in which the ICRCs operate can improve the relationship between CDC and the centers.

7.1 Address the Injury Marketing Problem

One challenge for the ICRC program is to address the marketing problem of the injury prevention and control field, which, as the evaluation findings suggested, is the biggest challenge ICRCs face. Injury is not well known or well funded within the public health field. Because the larger research community does not have a clear understanding of injury as a major public health problem, injury's lack of visibility makes recruiting researchers to the field and obtaining funding difficult.

> *"This is not an established field. There is a need to figure out how to get more attention paid to injury, get better access to data, get non-injury researchers to understand that this is a field, and get better surveillance."*
>
> *CDC Staff*

In fact, several centers indicated that a challenge associated with recruiting students to the injury prevention and control field is the limited funding that is available for graduate student research. Center directors reported the need for more funding for research and dissertation stipends for injury-focused research. This additional funding would help the injury prevention and control field compete with chronic disease, heart disease, and cancer research, which are fields that ICRCs indicate have more opportunities for paid graduate research.

> *"It is impossible to compete for good students without being able to support them with funding."*
>
> *ICRC Director*

CDC staff commented that CDC leadership can address the marketing problem by acknowledging publicly that injury is a public health problem and promoting injury as a valuable and viable area of public health research and practice. Respondents also indicated that CDC

should recognize that "building capacity to do research does not build a field." In addition, training people also does not make a field better if the need for research is not perceived as urgent. In promoting the injury prevention field, NCIPC staff and the ICRCs should be seen as valuable resources for advancing the field. Another strategy recommended by respondents to raise awareness of injury was to update the *Injury in America* report and promote it within the public health field.

7.2 Address Research Spectrum Issues

Another challenge to improving the ICRC program is for the injury prevention and control field to address research spectrum issues. For example, the ICRC funding opportunity announcement (FOA) released in 2008 made the centers aware of NCIPC's plan to encourage more injury research in the intervention and dissemination phases of the public health research spectrum. However, ICRC directors expressed concerns about a primary focus on translational and dissemination research. It appears that the increased amount of time and resources, and the cyclical nature of intervention and dissemination research make translational research more difficult to complete than the earlier phases of the public health research spectrum.

Moving research through the four phases of the public health research spectrum is not a linear process, which poses another challenge for program staff. Indeed, research can often

> *"The basic and applied research is much easier. If you work in the field on delivery and implementation, it is very complicated and it is very difficult to set up these interventions. Laboratory work is not as sticky as working in the community. People are inclined to do the earlier types of research rather than the implementation and delivery research."*
>
> *CDC Staff*

cycle back through the spectrum at various points. One ICRC director commented that, "even once work gets to the dissemination phase, there is often a need to loop back to foundational research to explore new questions that have been discovered."

Although the ICRCs recognize and agree with the CDC's shift to focus on translating research into practice, they do not want to lose the ability to conduct foundational research. This type of research, they contend, supports emerging ideas and results in innovations for the field of injury prevention and control.

7. 3 Increase Collaboration with CDC and Other Entities

Ten of the 12 ICRC directors who participated in the evaluation suggested that increased collaboration among the ICRCs, between the ICRCs and CDC, and between the ICRCs and other entities would improve injury research. Almost all of the CDC staff interviewed suggested that the ICRC program could be improved if more mechanisms were in place to promote collaboration and more opportunities were available for collaboration among centers and with CDC.

A suggestion for formalizing these collaborations is to require collaborations with other ICRCs or with CDC in future ICRC FOAs. Alternatively, using a cooperative agreement funding mechanism rather than a grant funding mechanism might facilitate more interaction between CDC and the grantee. Cooperative agreements are used when substantial programmatic involvement is expected between CDC and the funded center.[22] Another recommendation is to

[22] NIH, Office of Extramural Research, Types of Grant Programs, accessed July 2, 2009: http://grants.nih.gov/grants/funding/funding_program.htm#RSeries.

create an exchange program between the ICRCs and CDC staff whereby staff from CDC would spend time working at ICRCs and vice versa. This type of program would help each side understand the other and increase the potential for collaborative work. A final suggestion is to facilitate or require collaboration when ICRCs are located on campuses with other CDC or National Institutes of Health (NIH) research centers, such as the prevention research centers (PRCs), preparedness and emergency response research centers (PERRCs), and the National Institute for Occupational Safety and Health (NIOSH) research centers.

Several CDC staff raised challenges that may need addressing in promoting collaboration. First, the ICRCs, through the CDC grant mechanism, compete with each other and intramural researchers for limited resources. Any attempt to encourage collaboration must consider the competitive environment of academic research. According to one respondent, ICRCs should work collaboratively on successful projects to build stronger working relationships to strengthen the injury field.

A related challenge is the perception by CDC staff that research and program activities have been viewed historically as two distinct activities. CDC staff who participated in this evaluation indicated that this distinction is found throughout CDC and is carried over into many research centers. Traditionally, research is conducted in academic centers, and implementation is conducted by state health departments

> *"We have research going on by intramural scientists at CDC; then we fund state programs, cooperative agreements, R01s, and centers; and all are supposed to be working together. But sometimes it seems like there are five different groups and nobody talks to each other and nobody has a clue what the others are doing."*
>
> *CDC Staff*

or, in some cases, nongovernment or community-based organizations. Although the ICRC programs tend to work closely with community organizations, CDC can encourage and facilitate interaction between the two entities by using research findings for programs or interventions and by empowering programs to contribute to setting research agendas.

7. 4 Refocus Strategies and Award Processes for ICRC Grant Funding

Observations regarding funding ranged from identifying ways to increase funding to re-examining the allocation of CDC injury dollars and the ICRC review process for awards. For example, several center directors suggested returning to strategies used in the earlier rounds of ICRC funding. In the late 1980s, the ICRCs were expected to use the money for core activities (e.g., training, dissemination, building the field) and for a wide variety of seed and very small research projects that could not be funded easily through the R01 mechanism.

Under more recent ICRC FOAs, a large portion of center funding has been for large- and medium-sized research projects rather than smaller seed projects. These larger projects typically are robust enough to be funded through NIH or an R01 grant, but CDC's ICRC grant is the sole funding for seed and very small projects. Refocusing the ICRC FOA on small and seed projects could facilitate growth in the injury prevention and control field and potentially foster more innovative projects.

Another suggestion related to increased funding for the ICRC program was to eliminate the intramural research program at

> *"I just think that it is helpful for there to be more direct interaction between scientists and the opportunities to not only talk in a general way, but come up with some specific interests and capabilities of the intramural scientists at CDC. And the intramural researchers need to know what the ICRC researchers are working on."*
>
> *CDC Staff*

NCIPC and funnel the dollars to the ICRC program. This reallocation would encourage CDC's intramural researchers to collaborate with ICRC-based researchers. Intramural CDC injury researchers who wish to conduct independent, noncollaborative research would be required to compete for R01s in the same study-section-driven review process—and meet the same criteria for excellence—as extramural applicants.

Centers also expressed some concern about the possible creation of single-topic ICRCs. Though certain centers have developed expertise over time in particular areas, one respondent stated that "pigeonholing centers is not the best approach to represent NCIPC. Every center has areas of strength, but, if pigeonholed to that strength, the centers cannot capitalize on potential talent." The discussion of the ICRCs' monitoring and evaluation activities also revealed that the centers vary greatly in the types of monitoring and evaluation activities they conduct. These diverse evaluation activities may indicate that CDC needs to provide more specific guidance in the FOA on how the ICRCs should evaluate and monitor themselves.

A specific suggestion to improve the ICRC application process was revising the competitive grant renewal scoring system. In this revision, any future scoring system would provide a significant preference for existing ICRCs with satisfactory, long-term performance track records. A specific suggestion to improve the application process was to revise the scoring system for grant renewals to consider such factors as geography and past performance of ICRCs

7. 5 Improve Program Management and Communication Systems

Another recommendation for improving the ICRC program is to improve the program management and communication systems. For example, the ICRC program typically has one,

sometimes two, CDC program officers responsible for supporting and interacting with all of the funded ICRCs. Several of the ICRCs suggested increasing the number of CDC project officers who have clearly defined roles and responsibilities to address the provision of technical assistance and the needs of the ICRCs. The program officer role should include championing the ICRCs to NCIPC and CDC leadership. Each program officer should be responsible for no more than six centers to ensure that the ICRCs receive the necessary support. As a primary responsibility, program officers should develop summary documents of all the research and nonresearch activities for the ICRCs that they are responsible for managing. This document should be used to promote the successes of the ICRCs and to track center progress and achievements.

On a related note, many of the CDC staff interviewed for this evaluation provided suggestions for improving communication about center activities among centers and between CDC and the ICRCs. This could include notifying CDC staff and the general public about ICRC published articles, conducting reverse site visits of ICRCs to CDC, and/or utilizing distance technology to promote interaction between CDC and the centers.

Finally, some respondents offered that the ICRCs should be required to acknowledge CDC support for their work in promotional materials, published manuscripts, center newsletters, and on center Web sites. More importantly, CDC program officers should monitor this requirement to ensure that it happens. According to one respondent, "It should be part of normal operations, when research is

"Reverse site visits are very important. When we have a site visit and people go to the centers, it is only a few people. But with a reverse site visit, anyone at CDC can go and find out what is going on at the ICRCs. I wish there were more opportunities to interact with the people from the ICRCs."

CDC Staff

released, that [ICRCs] acknowledge that CDC funded it. This acknowledgment of CDC's support will build recognition of CDC's involvement in the field of injury research and could help in improving the injury 'marketing problem.'" Conversely, CDC could acknowledge the ICRCs' contributions when it reports on injury topics.

7.6 Create CDC Guidelines or Database to Track ICRC Publications

Another recommendation for improving the ICRC program is for CDC to develop guidelines or a database to track center publications. The ability to produce a high volume of publications is irrelevant if they are not easily cataloged for use by injury researchers and NCIPC. A critical finding of this portfolio evaluation is that no central repository or program database exists that captures all the publications produced by the ICRCs, even though publications are used as a standard measure of a center's worth. Without a way to catalog center publications, analyzing the publication history of the ICRC program is difficult because not all centers can report on their publications efficiently. In some cases, the data do not exist or are not available electronically. These differences in center reporting abilities limit the analysis of the evaluation findings because publication data for the centers are not comparable. However, given this limitation, the evaluation team did find that centers with a longer history of CDC ICRC funding appear to produce more publications. To enable the CDC's Extramural Research Program Office to promote the work of the ICRCs, and to address this limitation for future portfolio evaluation, NCIPC may want to consider creating a database, when resources become available, to track ICRC publications over time.

Conclusion

The challenges, observations, and recommendations made by the ICRC directors and staff, NCIPC staff, and the external peer review panel are valuable for improving the ICRC program. Many of these items aim to ensure that the contributions of the ICRCs' work are documented and accessible, while other items seek to improve program management, communication, and collaboration between the ICRCs and CDC.

Improving the ICRC program through these recommendations will improve the injury research field itself. The centers' core infrastructure, collaboration, and training activities, solely funded by the ICRC program, facilitate the multidisciplinary public health research and practice that is the hallmark of the ICRC program. Concrete outputs and outcomes of the ICRC research include publications, improvements in acute care and rehabilitation of injuries, programs and interventions, regulations, legislation, and policies that have contributed to changes in injury at both the individual and the population levels.

Although measuring the impact of the ICRC program on specific injury outcomes is challenging, the value of the ICRC program is considerable. CDC investment in the ICRC program and the ICRCs' ability to provide seed grants and training opportunities ensure that injury prevention and control develops as a research field with a viable career path for interested scientists. CDC also earns a return on its investment through the additional research dollars that the centers obtain by leveraging their CDC grants. In addition, the ICRCs' collaborations with other researchers and community members provide exposure to the CDC public health approach to injury research. The ICRCs' outreach ensures that CDC continues to have a presence at local, state, tribal, national, and international levels, while ICRC connections with policy makers

facilitates dialogue on injury regulations, legislation, and other policies that can affect injury outcomes at the population level.

Because this evaluation's findings overwhelmingly suggest that the ICRC program is a valuable asset to CDC's injury prevention and control mission, CDC should continue to encourage and support the ICRCs' efforts at the local, state, tribal, federal, and global levels. The ICRC program serves as the foundation on which injury prevention and control research is built, and CDC continuously improving the ICRC program is tantamount to improving the quality of injury research and practice. To this end, this report helps NCIPC leadership assess the merits of the ICRC program and implement the Board of Scientific Counselor's (BSC) consensus recommendations that ensure that centers remain strong and successful CDC partners poised for future growth in injury prevention and control.

Chapter 8. ICRC Portfolio Evaluation: Recommendations from the External Peer Review Panel

This chapter provides the external peer review panel's recommendations for the National Center for Injury Prevention and Control (NCIPC) Injury Control Research Center (ICRC) program. The introduction that follows describes the external peer review process, including the purpose of the external peer review panel, the method by which the panel members provided comments, and the context in which the recommendations should be reviewed. The panel's recommendations are organized by the following 12 topics:

1. training;
2. collaborations;
3. translational research;
4. advocacy and policy;
5. innovation;
6. global injury;
7. sustainability;
8. funding process;
9. performance expectations;

10. program management;

11. products; and

12. future evaluations.

This chapter includes all comments received from the external review panel and does not represent a set of consensus recommendations.

8.1 External Peer Review Process

Purpose. The external peer review panel was convened to review the findings from the NCIPC Injury Control Research Center Portfolio Evaluation, to assess the contributions of the ICRC program, and to make recommendations for program improvement. The reviewers included university researchers, injury prevention practitioners, and one association professional. The panelists were experienced in injury prevention and control research, policy, training, and collaboration. Several members also served in leadership or research positions for other Centers for Disease Control and Prevention (CDC) research centers, including the Centers for Public Health Preparedness and the National Academic Centers for Excellence on Youth Violence Prevention. None of the reviewers have had any formal relationships with any of the evaluated ICRCs in the 3 years prior to the review.

Review Method. The evaluation report was provided to each panel member for initial review. To facilitate discussion during the in-person review meeting, each member was asked to submit written comments and recommendations before the meeting. At the meeting, reviewers discussed the findings of the report and made recommendations for program improvement.

The reviewers discussed initial recommendations at two closed sessions and then refined and communicated their recommendations to the evaluation team at several open sessions. Formal recommendations were summarized at the end of the meeting. Written recommendations submitted before the meeting were incorporated into the summary recommendations, where appropriate.

Context of the External Peer Review Recommendations. Overall, the external peer review panel praised the valuable contributions of the ICRCs in building the injury prevention and control field. The panel's recommendations for improving the program should be viewed in that context. Among the valuable contributions discussed, the panelists noted that the centers are responsible for conducting and disseminating important injury research. Other center contributions included training students and professionals, participating in professional injury organizations (such as the Society for the Advancement of Violence and Injury Research and the American Public Health Association) and serving on the editorial boards of injury journals.

The reviewers also made many recommendations to improve the ICRC program and to add greater value to the injury field. To facilitate these recommendations, the reviewers emphasized that it was critical that funding for NCIPC and, subsequently, the ICRC program be increased. The panel recommended a strategic, coordinated marketing effort to improve awareness of injury as a problem in the hopes that ultimately, this would help increase funding for injury research. All agreed funding should be commensurate with the burden of injury. As one reviewer commented, "The entire program, intramural and extramural, is woefully underfunded relative to the burden of injury in the United States."

NCIPC leadership indicated to the reviewers that additional Congressional allocations for the ICRC program are unlikely. However, the reviewers purposely did not limit their recommendations based on cost. The reviewers suggested that their recommendations guide NCIPC in conducting long-term, strategic planning for the ICRC program, prioritizing those items that can be implemented immediately and funding additional recommendations as more money becomes available. Finally, the panel requested from NCIPC leadership a formal summary of the Board of Scientific Counselors' recommendations regarding any immediate changes to be made to the ICRC program.

8.2 ICRC Peer Review Panel Recommendations

The panel's recommendations discussed below are organized in 12 categories that reflect core activities identified within the ICRC Implementation Logic Model or program management activities.

8.2.1 Training

A primary contribution of the ICRC program is the training of students, faculty, staff, and practitioners. The panel proposed strategies to increase the number of students exposed to injury prevention and control and to improve the mentoring of trainees. Another set of training recommendations focused on facilitating the sharing of training materials and standardizing training opportunities. The panel also recommended developing tracking and monitoring systems so that ICRCs can determine if they have achieved training outcomes.

The panel's recommendations to increase the number of students and researchers exposed to injury prevention and control included the following:

- Encourage funding of dissertation research grants for graduate students within ICRCs.
- Create a separate funding stream for dissertation research grants that is external to the ICRC program and open to both CDC-funded centers and other academic institutions.
- Develop a separate training grant mechanism funded with dollars outside of the ICRC program and institute an open competition for these grants.
- Create opportunities to expose students in other fields, such as education, psychology, engineering, and city planning, to the injury field.

The panel's strategies to promote the mentoring of trainees included the following:

- Create a national network of injury researchers, experts, and mentors and a directory of these individuals to facilitate the matching of trainees with mentors.
- Create opportunities for dissertation students to spend 3 months at CDC to build relationships with NCIPC scientists and potentially collaborate with NCIPC scientists.

The panel's recommendations addressing the standardization of training opportunities included the following:

- Create a core curriculum tied to core competencies.
- Encourage development of a formal, organized training program for graduate students at ICRCs.

- Facilitate sharing of training materials by creating a repository for training materials that will serve as a national/global resource. This repository could include lectures, curriculum, and teaching tools.

Finally, the panel's recommendations related to tracking and monitoring trainees included the following:

- Develop a systematic classification system for tracking and monitoring training (see page 38), while recognizing the burden of data collection on centers.
- Include in any tracking system that is developed, measures of productivity for trainees and monitoring of student trainees that stay in the injury field.

8.2.2 Collaborations

Collaboration helps to leverage CDC research dollars, prevents duplication of research, increases the resources available to a project, and can lead to better research. However, all stakeholders who evaluated the ICRC program agreed that the program's collaborative efforts need to be improved. For example, the panelists recommended that CDC more actively coordinate, administer, and facilitate collaborations. Recommendations to improve collaboration among the ICRCs, between the ICRCs and NCIPC, and between the ICRCs and others, are described below.

8.2.2.1 Collaborations Among ICRCs

NCIPC should foster collaboration among the ICRCs to maximize their investments in injury prevention and control research. The panel's recommendations for doing so included the following:

- Create a separate funding stream for collaborations and cross-site/multi-site research projects. The funding stream should cover costs for identifying injury issues and needs that could be addressed more effectively through collaborative, cross-site research. The funding stream should also be used to cover costs for planning and conducting these novel projects across centers. This funding should be available through a program announcement mechanism to expedite the awarding of monies as they become available.

- Identify and implement methods to facilitate collaboration among the ICRCs, such as

  - Require attendance at an annual meeting of the centers/principal investigators with CDC/NCIPC, to which travel is funded in the ICRC budgets

  - Encourage the use of technology (Skype, Webinars, conference calls, etc.) to supplement face-to-face meetings.

8.2.2.2 Collaborations Between ICRCs and CDC/NCIPC

Facilitating collaborations and relationships between the ICRCs and the NCIPC's Extramural Research Program Office and, most importantly, between the ICRCs and the NCIPC scientists is

needed to capitalize on the talent, experience, and knowledge both within and external to CDC. The panel's recommendations for facilitating these collaborations included the following:

- Encourage and facilitate interaction between ICRCs and NCIPC scientists by holding annual meetings on-site at CDC.
- Identify a mechanism/method to create a constant flow of communication between ICRC researchers and NCIPC scientists, such as a monthly injury Webinar that is open to anyone interested. This would provide opportunities for both NCIPC scientists and ICRC researchers to present and discuss their ongoing and completed research, and would further understanding of research interests and strengths in both groups.
- Explore the possibility of using cooperative agreements to fund centers.
- Create an ICRC program newsletter and disseminate it through the NCIPC.
- Find ways to improve communication of major research findings or ICRC-sponsored events from the ICRCs to CDC staff.
- Allow NCIPC scientists and ICRC researchers to participate in short-term assignments within an ICRC or at CDC.

8.2.2.3 Collaborations Between ICRCs and Others

ICRCs collaborating with organizations other than CDC provide opportunities for additional funding and other resources. The panel's recommendations to facilitate collaborations among

centers; other CDC organizations, divisions, and funded centers; and other injury researchers included the following:

- Encourage the inclusion and support of nontraditional research partners, such as city planners and engineers.

- Encourage NCIPC to formalize links with other federal funders (National Highway Traffic Safety Administration, Substance Abuse and Mental Health Services Administration, National Institutes of Health, etc.).

- Use the funding opportunity announcement (FOA) mechanism to encourage collaboration between centers and other injury researchers. This practice would apply to separate research grants, not just ICRC grants.

- Reward collaborative efforts in the re-application process, e.g. by providing higher scores to centers that have demonstrated collaborations or have documented their plans to collaborate. This recommendation does not include requiring collaboration in the FOA.

- Create a national network of injury researchers, experts, and mentors. This network should also include NCIPC scientists. (This recommendation is cross-listed as a training recommendation).

- Identify, publicize, and encourage co-funding opportunities with private, state, federal, and international organizations.

- Develop a monthly injury Webinar open to anyone interested, similar to a grand rounds concept that would allow injury researchers to present their findings. This would include NCIPC scientists, ICRC researchers and other injury researchers. The webinars could be archived in the NCIPC repository or at and ICRC site. (This recommendation was also included in the collaboration between the ICRCs and CDC/NCIPC.)

- Encourage global research and partnerships beyond the 2004 FOA, which encouraged ICRCs to address international injury priorities through consultation and technical assistance. Increased global activities in the ICRC program would promote reciprocal learning; that is, the United States can both learn from and share our knowledge with other countries.

8.2.3 Translational Research

Translational research moves basic scientific discoveries into clinical or population-based applications to improve health. The external peer reviewers encouraged CDC to foster more translational research in the ICRC program. The panel's recommendations for greater focus on translational research are provided below:

- Clarify the definition of translational research as it pertains to the ICRCs and the injury prevention and control field.
- Require that ICRC applicants, in lieu of the FOA requirement, include a translational research project in the grant application and describe how they will move seed and other projects through the research spectrum to translation, if appropriate.

- Identify a CDC or ICRC scientist with expertise in translational research who could assist centers with translational research efforts.
- Provide formal training to build translational research skills among injury researchers.
- Produce a formal document that showcases the impact of ICRC translational research on injury outcomes.
- One reviewer proposed the creation of a specific ICRC on translational research; however this recommendation was not endorsed by the other five panelists.

8.2.4 Advocacy and Policy

Advocacy and policy are among the key strategies by which the ICRCs promote population-based approaches to injury prevention and control. The ICRC portfolio evaluation revealed differences in what centers think they are able to do to affect policy. These differences typically result from real or perceived restrictions associated with ICRCs receiving federal or state funding. Although lobbying is prohibited, advocating for injury prevention and control and educating policy makers on potential strategies for injury prevention and control are not only permitted but encouraged. In order to encourage ICRC advocacy and policy activities, the panel provided the following recommendations:

- NCIPC should clarify which policy and advocacy activities are permitted under federal funding guidelines.

- Policy impact on the state and local levels is important, as is policy on a national level. NCIPC should work with ICRCS to identify how the centers can collaborate on efforts that affect national policy.

- Encourage ICRCs to engage with external partners (other researchers, practitioners, NGOs, professional associations and others) in policy and advocacy efforts.

8.2.5 Innovation

A key finding of the evaluation is that center funding facilitates multidisciplinary research. The panel recognized the innovative contributions of the ICRC program over the last 20 years and provided recommendations for encouraging even more innovation within the centers. These included the following:

- Provide the centers, in the FOA, with the option of proposing a mix of seed projects, small projects, and large projects, rather than requiring that centers must propose at least one R01 project.

- Provide doctoral dissertation grants that will attract junior researchers and their advisors and committee members to the ICRCs. This infusion of scientists could bring fresh ideas to the centers.

- Encourage or require senior researchers and faculty in the ICRCs to maintain their involvement in the center by serving as reviewers for seed projects and mentoring junior researchers.

- Encourage research collaboration between junior and senior researchers.

- Continue to permit centers to apply for ICRC grants without a single-themed focus.

8.2.6 Global Injury Prevention and Control

The ICRC FOAs have only addressed international injury priorities since 2004. Because global relationships can benefit NCIPC and researchers in the United States, as well as the international partners, NCIPC should encourage more global research projects and partnerships. The reviewers identified the following recommendations to improve the global injury impact:

- Increase awareness of opportunities to fund and conduct global research.

- Facilitate the sharing of successful global proposals (e.g., Fogarty grants).

- Encourage CDC scientists to communicate with ICRC researchers when CDC scientists receive international requests for research collaboration and assistance.

8.2.7 Sustainability

Although a steady source of funding is critical for maintaining an ICRC, the sustainability of a center also can be influenced by the reputation and capability of the center director, the impact of research and science produced, and a strong university/host relationship. The external review panel strongly recommended that NCIPC determine whether it intends to sustain centers indefinitely or if it prefers to provide short-term funding to jump start more injury research programs. If NCIPC intends to sustain a key number of high-quality centers, then

criteria for continued funding need to be clearly established. Finally, NCIPC should find a way to balance the need to sustain established centers with efforts to encourage new centers to apply.

The panel's recommendations related to sustainability included the following:

- NCIPC needs to define *sustainability* for the program and identify ways to facilitate the centers' sustainability, regardless of how it is defined.
- ICRCs should be funded for a minimum of 5 years.
- Center directors should be required to develop a succession plan and fund the appointment of an associate director.

8.2.8 Funding Process

The panel made many recommendations to improve the competitive funding process by which the ICRC grants are awarded. The recommendations below focus on improving the application, review, and award process and ensuring transparency in the funding process:

- Develop a firm understanding of the consequences to an established, historically funded ICRC if its ICRC grant is lost.
- Research the pros and cons of moving to a cooperative agreement mechanism.
- Streamline the application process by improving the clarity of the FOA. (For example, post a sample of a highly scored application as a template.)

- Create a FOA that provides clear instructions about application requirements for content, context, activities and the scoring of these. This should include clarity with respect to criteria for funding centers, any special considerations that will be given for geographic or topical factors.

- Create an FOA that provides centers with the flexibility to propose appropriate projects for their region, staff, and expertise.

- Allow centers to be flexible in the activities they propose, within the core activities required as part of the ICRC grants. For instance, some centers focus more on community outreach than surveillance, whereas others may have a greater focus on education of research trainees. This also needs to be taken into account in the review process.

- NCIPC should not require that every project be a new idea, but encourage ICRCs to build on previous work in order to refine and translate interventions to practice.)

- Create a two-component funding and review process. One component would be open to new ICRCs, and the other would be open to established ICRCs. This process would allow NCIPC to sustain existing centers while funding new centers and would eliminate competition between new and well-established centers. It would also allow for reviewers to take into account the developmental stage of a center in the review process. Require in the FOA that centers participate in question-and-answer sessions with the NCIPC director—either in person or remotely as part of the review process.

- Require in the FOA, if the competition for center status is regional, that an ICRC interact with organizations in their catchment areas.

- Consider the timing of the renewal cycle. A longer funding cycle might allow centers to perform research requiring a longer timeframe as well as more translational research. The 5-year cycle is limiting in that it requires projects to produce results in 4 years so they can demonstrate productivity in the next renewal cycle. This undoubtedly limits the type of research that is considered viable for funding.

- Provide better guidelines about NCIPC's research priorities for grant application reviewers.

- Provide instructions and training for reviewers that address review and scoring guidelines specific to the CDC ICRC program, since these may differ from other federal agency review and scoring processes.

- Take a holistic approach to scoring centers that considers, for example, the overall quality of the science; the degree to which the research can be translated to practice and the amount of time this might take; inclusion of community, national, and global outreach; and the degree to which the research might decrease injury morbidity/mortality.

8.2.9 Performance Expectations

In reviewing the evaluation findings report, the panel noted that the ICRC program did not have defined, measureable goals or objectives. The panel recommended identifying process and

outcome measures and setting goals for each of these measures so that CDC and the ICRCs can track, monitor, and demonstrate success. NCIPC should develop and communicate specific performance expectations to the ICRCs. The panel's recommendations to address this included the following:

- Identify core elements or activities that all centers are expected to conduct. Communicate these expectations to the centers and invite their feedback.
- Develop key measures or benchmarks for each core element or activity so that centers know the expectations.
- Identify a specific goal or performance expectation for translational research activities.
- Recognize that ICRCs with a trauma or rehabilitation focus may require different measures than ICRCs with a training or community focus. Potential performance expectations may include measures related to interventions or policies that address clinical practice.

8.2.10 Program Management

A primary goal of the ICRC portfolio evaluation was to identify areas for program improvement. Although many factors that address program improvement require participation from the ICRCs, the panel stressed that improvements in program management at NCIPC are also needed to achieve overall improvement. The panel recommended that NCIPC address the following items for the administrative management of the ICRC program:

- Reassess and minimize the barriers to collaboration between NCIPC and ICRCs.

- Encourage one-on-one meetings between the new NCIPC director and ICRC directors. These discussions should focus on how CDC can help the ICRCs maximize resources and collaborations and increase resources for the ICRC program.

- Identify administrative best practices at current ICRCs and facilitate the sharing and adoption these best practices among ICRCs. (Examples of best practices that could be shared among the centers include succession plans for new directors or the trainee tracking program developed at some Centers.)

- Collect information on unintended consequences of policies or interventions so that injury researchers at CDC-funded ICRCs and other injury research institutions can learn from them.

- Improve the tracking, monitoring, and documentation of ICRC accomplishments. This practice should include all activities, not just training activities.

- Assign more than one program officer to provide support to the ICRCs.

- Ensure that the qualifications for the ICRC program officer include a background in evaluation.

- Require that ICRCs acknowledge partial or full CDC funding in publications and presentations.

8.2.11 Products

NCIPC should take the lead in creating a database of products developed by the ICRCs. An example of this type of database is the Centers for Public Health Preparedness Resource Center that is maintained by the Association of Schools of Public Health (ASPH) and accessible through the ASPH website. These products could be shared with injury researchers, students, practitioners, non-governmental organizations (NGO), government agencies and policymakers nationally and internationally and would further the reach of the ICRC program. The panel's specific recommendations included the following:

- Create a repository of publications and people trained, including trainees' contributions to the injury field (see tracking and monitoring of trainees above); technical assistance provided; interventions developed; tools created; curricula and lectures; and any other products related to the ICRCs' core activities.

- Encourage ICRCs to upload injury lectures into the SuperCourse portal at the University of Pittsburgh, in addition to including them in the NCIPC repository.

- Consider providing media awareness training for the ICRCs so that they can promote their work and the ICRC program more effectively.

8.2.12 Future Evaluations

Although the external peer review panel commended the ICRC portfolio evaluation, the reviewers identified several concerns and suggestions that should be addressed to prepare the ICRC program for a more thorough evaluation in the future, preferably within the next 5 years. Challenges identified included measuring the impact of the ICRC program on human health at

the individual and population levels, measuring the impact of translational research and translational activities, and monitoring and documenting the contributions of the ICRCs so that future evaluations can use concrete, objective measures rather than relying primarily on anecdotal information. Potential questions to answer in future evaluations might include 1) how have the ICRCs laid the groundwork for the injury field? and 2) how do the centers grow the injury field? NCIPC should identify evaluation questions and address data collection requirements in future FOAs to prepare the centers for providing standardized data that can be used to answer the evaluation questions. Standardized data may include information on trainees, educational efforts, leveraging of funding, increased funding for injury research, documentation of collaborations, etc.

The panel's specific recommendations for future evaluations included the following:

- Provide grant funding of more than 5 years to ensure that ICRCs can measure population-level changes.
- Include requirements to measure population-based changes in the FOA, when appropriate.
- Identify strategies to support evaluations of behavioral and community interventions.
- Include in future ICRC program evaluations impact that the ICRC program has had on the development and contributions of non-CDC-funded injury research centers.
- Involve external stakeholders in future evaluations.

- Include all centers in future evaluations. Newly funded centers that did not participate in this evaluation could have provided information about why they decided to apply for center funding, whether they already had infrastructure in place, and how they established the center without CDC funds.

- Describe the ICRCs' involvement in and contributions to professional organizations such as the Society for the Advancement of Violence and Injury Research and the American Public Health Association.

- Focus the next evaluation more on determining effective approaches at different centers for accomplishing similar objectives. With increased clarity on the goals and objectives of the ICRC program and guidance on data collection to measure performance, ICRCs should be able to supply more comparable and meaningful data for the next evaluation.

- Include in the next evaluation an inventory of key activities, since this first evaluation only focused on identifying components and examples of ICRC activities. The panelists noted that these examples may not provide a complete picture of the impact of the program on the injury field.

- Conduct a bibliometric analysis both with publications for the general public and with scientific publications.

- Continue to obtain stakeholder input on instrument development and data collection methods. However, the directors of the ICRCs that will be evaluated should not be part

of this process. Although this evaluation was conducted on the grant program and not on individual ICRCs, the ICRC directors who participated on the internal review panel had prior knowledge of the evaluation instruments and related strategies and processes. Therefore, there is some thought that ICRCs were not on an equal footing with the other ICRCs in the evaluation. However, during this portfolio evaluation, two ICRC directors served on the ICRC Portfolio Evaluation Workgroup and were charged with sharing information about the evaluation with other ICRC directors. The evaluation team also updated the ICRC directors about the status of the evaluation during monthly ICRC calls. Finally, all ICRC directors were provided with a copy of the data collection instruments for review prior to the instruments being finalized. We will continue to obtain stakeholder input on the instrument and data collection methods while not directly involving the ICRCs in this process.

- Identify in future evaluations how the ICRCs can most effectively affect the health of populations through their injury research.

Conclusion

The external peer review panel provided numerous insights and recommendations for evaluating the ICRC program. The recommendations focused on core activities identified in the logic models and strategies for improving management of the ICRC program. Implementing some or all of these recommendations should lead to better program management, improved injury prevention and control research, and, ultimately, decreases in injury morbidity and mortality.

Appendix A: 2007 ICRC Funding Opportunity Announcement

Part I Overview Information

Department of Health and Human Services

Issuing Organization
Centers for Disease Control and Prevention (NCIPC/CDC) at (http://www.cdc.gov/ncipc/)

Participating Organizations
Centers for Disease Control and Prevention (CDC), at (http://www.cdc.gov/)

Components of Participating Organizations
National Center for Injury Prevention and Control (NCIPC) at (http://www.cdc.gov/ncipc/)

Title: Grants for Injury Control Research Centers

The CDC policies, guidelines, terms, and conditions stated in this announcement may differ from those used by the NIH.

Authority: This program is authorized under section 301 (a) [42 U.S.C. 241(a)] of the Public Health Service Act, and Section 391 (a) [42 U.S.C. 280 b (a)] of the Public Service Health Act, as amended.

Announcement Type: New

Program Announcement (PA) Number: PA-CE07-001

Catalog of Federal Domestic Assistance Number: 93.136, Injury Prevention and Control Research and State and Community Based Programs

Key Dates
Release Date:
Letters of Intent Receipt Date: 08/02/2006
Application Receipt Dates: 09/01/2006
Peer Review Date: 03/10/2007
Council Review Date: 04/12/2007
Earliest Anticipated Start Date: 09/01/2007
Additional Information to Be Available Date: 03/30/2006
Technical assistance will be available for potential applicants during one conference call. The call for eligible applicants will be held on 03/30/2006 from 1:30 p.m. to 2:30 p.m. (Eastern Time). The conference can be accessed by calling 1-800-475-8401 and entering pass code ATIJANI. The leader is Ademola Tijani.
Expiration Date: September 2, 2009

Due Dates for E.O. 12372
Executive Order 12372 does not apply to this program.

Additional Overview Content

Executive Summary
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- The Centers for Disease Control and Prevention (CDC) announces the availability of fiscal year

(FY) 2007 funds for grants for Injury Control Research Centers (ICRC).

- Approximately $5,433,000 **in total funds** is expected to be available, the funding level will not exceed $905,500 (including both direct and indirect costs) per year, and the project period is up to five years.
- Six awards will be funded**.**
- The award mechanism is a R49 grant.
- Eligible organizations include **public and private non-profit and for-profit organizations, small, minority and women-owned businesses**, colleges and universities, research institutions, hospitals, community-based organizations, faith-based organizations, **Federally-recognized** Indian tribal governments, **Indian tribes, Indian tribal organizations, and State and local governments or their Bone Fide Agents, and political subdivisions of States (in consultation with States)**. If the omission of small, minority, women-owned businesses was intentional, please provide a **justification memo** for this exclusion. If Bone Fide Agents and political subdivisions of States (in consultation with States) were intentionally omitted, please provide a **justification memo** for their exclusion.
- To be eligible for this PA, applicants must demonstrate expertise and experience in conducting and publishing injury research in peer-reviewed journals.
- See Section IV.1 for application materials.
- CDC Telecommunications for the hearing impaired is available at: TTY 770-488-2783.

Table of Contents

Part II - Full Text of Announcement

Section I. Funding Opportunity Description

1. Research Objectives

The CDC and NCIPC are committed to achieving the health promotion and disease prevention objectives of "Healthy People 2010" and to measuring program performance as stipulated by the Government Performance and Review Act (GPRA). This PA addresses "Healthy People 2010" priority area of injury and violence prevention and is in alignment with NCIPC's performance goal to conduct a targeted program of research to reduce injury-related death and disability. For more information, see www.health.gov/healthypeople and www.whitehouse.gov/omb/mgmt-gpra/.

The purposes of the NCIPC Injury Control Research Centers (ICRC) program are to:

- Build the scientific base for the prevention and control of fatal and nonfatal injuries and related disabilities.
- To integrate, in the context of a national program, professionals from a wide spectrum of disciplines of epidemiology, behavioral and social sciences, medicine, biostatistics, public health, health economics, law, criminal justice, and engineering to perform research in order to prevent and control injuries more effectively.
- Encourage investigators to propose research that involves intervention development and testing as well as research on methods to enhance the adoption and maintenance of effective intervention strategies among individuals, organizations, or communities.
- To provide technical assistance to injury prevention and control programs within a geographic region.

For the research component of this announcement, NCIPC is soliciting investigator-initiated research that will help expand and advance our understanding of fatal and nonfatal injuries and related disabilities, their causes, and prevention strategies. Relevant research objectives include the following:

1. Dissemination Research:
Conduct studies to build knowledge on methods, structures, and processes to implement existing evidence-based interventions, programs and policies to prevent injuries and related disabilities. This research is intended to bridge the gap between prevention research and everyday practice by building a knowledge base about how evidence-based prevention information and strategies are disseminated, translated and integrated for use by communities and policy makers. Evidence-based interventions, programs, and policies are defined as those for which there is evidence of effectiveness in reducing injuries and disabilities based on systematic reviews of the field or two or more well designed studies.

2. Intervention Evaluation Research:
Evaluate the efficacy, effectiveness, and cost effectiveness of primary prevention or control interventions, programs, and policies to prevent injuries and related disabilities.

Rigorous evaluations are needed to determine the effectiveness of interventions, programs, and policies addressing the prevention or control of injuries. Experimental designs are strongly encouraged. However, NCIPC will consider other evaluation designs, if justified, as required by the needs and constraints in a particular setting.

For effective interventions, it is possible to do cost-effectiveness studies. To be comparable to other cost effectiveness studies, they should follow the guidelines in the following references:
Gold MR, Siegel JE, Russell LB, Weinstein MC. Cost-effectiveness in Health and Medicine. New York: Oxford University Press, 1996.

Haddix AC, Teutsch SM, Corso, PS. Prevention Effectiveness: A Guide to Decision Analysis and Economic Evaluation. Second Edition. New York: Oxford University Press, 2003.

For randomized trials, applicants are encouraged to clearly state how study subjects, whether individuals or groups, were selected, randomized, and followed through the trial. One relevant useful guidance document is Moher D, Schulz KF, Altman D. The CONSORT Statement, JAMA 2001;285:1987-2001.
3. Foundational Research:
Foundational research covers the basic studies and public health surveillance approaches that define and quantify the extent of an injury problem. These activities establish the causes of injuries, create causal models for injury prevention, and provide a foundation for developing theory-based interventions.

4. Developmental Research:
Developmental research supports the design and preliminary testing of potential strategies to prevent and control injuries. Included are risk-factor research and pilot and feasibility studies that measure how interventions affect key variables in the causal chain.

See Section VIII, Other Information - Required Federal Citations, for policies related to this announcement.

Section II. Award Information

1. Mechanism(s) of Support

This funding opportunity will use the R49 grant award mechanism.

As an applicant, you will be solely responsible for planning, directing, and executing the proposed

project.

This funding opportunity uses the just-in-time budget concepts. It also uses the non-modular budget format described in the PHS 398 application instructions (see http://grants.nih.gov/grants/funding/phs398/phs398.html). A detailed categorical budget for the "Initial Budget Period" and the "Entire Proposed Period of Support" is to be submitted with the application.

2. Funds Available

The participating CIO, NCIPC, intends to commit approximately $5,433,000 (both direct and indirect costs) in FY 2007 to fund six awards. The average award amount will be $905,500. This includes both direct and indirect costs and is for the first 12- month budget period. An applicant may request a project period of up to five years. An applicant may request up to $1,055,500 (both direct and indirect costs) ($150,000 above the expected award amount to allow for the inclusion of the description of an additional large project as described in Section IV. Application and Submission Information, 2. Content and Form of Application Submission 4.b. (2), but each award will be no more than $905,500 (both direct and indirect costs). The approximate total project period funded amount is $4,527,500 (including both direct and indirect costs), with a maximum of $905,500 per year. The anticipated start date for new awards is September, 2007.

All estimated funding amounts are subject to availability of funds.

Consideration will also be given to current NCIPC ICRC grantees who submit a competitive supplement application requesting one year of funding to enhance or expand existing projects, or to conduct one-year pilot studies. These awards will not exceed $150,000 (both direct and indirect costs). Supplemental awards will be made for the budget period to coincide with the actual budget period of the grant and are based on the availability of funds.

If you request a funding amount greater than the ceiling of the award range, your application will be considered non-responsive, and will not be entered into the review process. You will be notified that your application did not meet the submission requirements.

Although the financial plans of NCIPC provide support for this program, awards pursuant to this funding opportunity are contingent upon the availability of funds, evidence of satisfactory progress by the recipient (as documented in required reports), and the determination that continued funding is in the best interest of the Federal Government.

Facilities and administrative costs requested by consortium participants are not included in the direct cost limitation, see NOT-OD-05-004.
Use of Funds:

Center funding is to be designated for two types of activities. One type of activity is considered core and includes administration, management, general support services (e.g., statistical, library, media relations, and advocacy) as well as activities associated with research development, technical assistance, and education (e.g., seed projects, training activities, and collaborative and technical assistance activities with other groups). Funds may be allocated for trainee stipends, tuition remission, and trainee travel in accordance with the current rates for the United States Public Health Service agencies. Indirect costs for these trainee-related activities are limited to eight percent.

Defined research projects constitute the second type of activity, and ICRCs are encouraged to work toward addressing the breadth of the field. Core activities and defined research projects may each constitute between 25 percent and 75 percent of the operating budget, and should be balanced in such a way that the ICRC demonstrates productivity in research as well as teaching and service. Applicants with less demonstrated expertise in research are encouraged to devote a larger percentage of funds to defined research projects in order to establish their capability as research centers of

excellence.

Grant funds will not be made available to support the provision of direct care. Studies may be supported which evaluate methods of acute care and rehabilitation for potential reductions in injury effects and costs. Studies may be supported which identify the effect on injury outcomes and cost of systems for pre-hospital, hospital, and rehabilitative care and independent living.

Eligible applicants may enter into contracts, including consortia agreements (as set forth in the PHS Grants Policy Statement, dated April 1, 1994), as necessary to meet the requirements of the program and strengthen the overall application.

Funding Preferences:
At the discretion of the Director, NCIPC, additional consideration may be given to re-competing ICRCs. These centers represent a long-term investment for NCIPC and an established resource for injury control-related issues for their States and regions.

Section III. Eligibility Information

1. Eligible Applicants

1.A. Eligible Institutions

You may submit an application if your organization has any of the following characteristics:

- Public nonprofit organizations
- Private nonprofit organizations
- For profit organizations
- Small, minority, women-owned businesses
- Universities
- Colleges
- Research institutions
- Hospitals
- Community-based organizations
- Faith-based organizations
- Federally recognized Indian tribal governments
- Indian tribes
- Indian tribal organizations
- State and local governments or their Bona Fide Agents (this includes the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, the Commonwealth of the Northern Marianna Islands, American Samoa, Guam, the Federated States of Micronesia, the Republic of the Marshall Islands, and the Republic of Palau)
- Political subdivisions of States (in consultation with States)

A Bona Fide Agent is an agency/organization identified by the state as eligible to submit an application under the state eligibility in lieu of a state application. If you are applying as a bona fide agent of a state or local government, you must provide a letter from the state or local government as documentation of your status. Place this documentation behind the first page of your application form.

This announcement will provide funding for applicants in regions that do not have funded Injury Control Research Centers (ICRCs) and for applicants in regions that have funded Centers that must re-compete for funding

Eligible applicants are limited to organizations in Department of Health and Human Services (DHHS)

Region I (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont), Region II (New Jersey, New York, Puerto Rico, and Virgin Islands), Region III (Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia), Region V (Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin), Region VI (Arkansas, Louisiana, New Mexico, Oklahoma, and Texas), Region VII (Iowa, Kansas, Missouri, and Nebraska), Region VIII (Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming), and Region IX (Arizona, California, Hawaii, Nevada, American Samoa, Guam, Mariana Islands, Marshall Islands, Micronesia, and Palau).

Note: ICRC grant awards are made to the applicant institution/organization, not the Principal Investigator.

1.B. Eligible Individuals

Any individual with the skills, knowledge, and resources necessary to carry out the proposed research is invited to work with their institution to develop an application for support. Individuals from underrepresented racial and ethnic groups as well as individuals with disabilities are always encouraged to apply for CDC programs. Collaborations with foreign institutions are allowed if they provide injury prevention and control information relevant to the injury prevention and control problems in the United States.

To be an eligible applicant under this PA, the principal investigator must have conducted injury prevention research, published the findings in a peer-reviewed journal, and have specific authority and responsibility to carry out the proposed project. Applications from principal investigators who do not meet these requirements will be considered non-responsive and will not be reviewed.

2. Cost Sharing or Matching

Cost sharing, matching, or cost participation are not required.

The most current Grants Policy Statement can be found at:
http://grants.nih.gov/grants/policy/gps/

3. Other-Special Eligibility Criteria

Applicants must be responsible for the following activities:

- Demonstrate expertise and experience in conducting and publishing injury research in at least one of the three phases of injury control (prevention, acute care, or rehabilitation) and are encouraged to be comprehensive.
- Document ongoing injury control-related research projects and activities currently supported by other sources of funding.
- Provide a director (Principal Investigator) who has specific authority and responsibility to carry out the project. The Director must report to an appropriate institutional official, e.g., Dean of a school, Vice-President of a University, or Commissioner of Health. The director must have no less than thirty percent effort devoted solely to this project with an anticipated range of thirty percent to fifty percent.
- Provide evidence of working relationships, including consultation and technical assistance, with outside agencies and other entities in the region in which the ICRC is located which will allow for implementation and evaluation of any proposed intervention activities.
- Provide evidence of involvement of specialists or experts in medicine, biomechanics and other engineering, epidemiology, law and criminal justice, behavioral and social sciences, biostatistics, and public health as needed to complete the plans of the center. These are considered the disciplines and fields for ICRCs.
- Have established curricula and graduate training programs in disciplines relevant to injury control.
- Have experience in disseminating injury control research findings, translating them into interventions (i.e., programs or policies), and evaluating their effectiveness.

If your application is incomplete or non-responsive to the special requirements listed in this section, it will not be entered into the review process.

Note: Title 2 of the United States Code Section 1611 states that an organization described in Section 501(c)(4) of the Internal Revenue Code that engages in lobbying activities is not eligible to receive Federal funds constituting an award, grant, or loan.

Section IV. Application and Submission Information

1. Address to Request Application Information

The PHS 398 application instructions are available at http://grants.nih.gov/grants/funding/phs398/phs398.html in an interactive format. Applicants must use the currently approved version of the PHS 398. For further assistance contact GrantsInfo, Telephone (301) 435-0714, Email: GrantsInfo@nih.gov.

Telecommunications for the hearing impaired: TTY 770-488-2783.

If you do not have access to the Internet, or if you have difficulty accessing the forms on-line, you may contact the CDC Procurement and Grants Office Technical Information Management Section (PGO-TIM) staff at: 770-488-2700. Application forms can be mailed to you.

2. Content and Form of Application Submission

Applications must be prepared using the most current PHS 398 research grant application instructions and forms. Applications must have a Dun & Bradstreet (D&B) Data Universal Numbering System number as the universal identifier when applying for Federal grants or cooperative agreements. The D&B number can be obtained by calling (866) 705-5711 or through the web site at http://www.dnb.com/us/. The D&B number should be entered on line 11 of the face page of the PHS 398 form.

The title and number of this funding opportunity must be typed on line 2 of the face page of the application form and the YES box must be checked.

Abstract (Overall Application Summary and Relevance)

It is especially important that the abstract (Description, PHS 398 form page 2) of your grant application reflects the overall application's (both core and research) focus, because if your application is funded, your abstract will become public information.

The language of the abstract must be simple and easy to understand for a broad audience.

For more information on how to write an abstract please see the "Structured Abstracts" section at: http://jama.ama-assn.org/ifora_current.dtl

Center Description

Applications should include the following information, detailing activities to be conducted for the first budget year, while briefly addressing activities to be conducted over the entire five-year project period.

- Face page
- Description (abstract) and personnel
- Table of contents
- Detailed budget for the initial budget period: The budget should reflect the composite figures for the grant. In addition, separate budgets (direct and indirect costs) and justifications

should be provided for the following categories of activities:

8. a. Core activities, including management and administrative functions, other non-research activities (e.g., education/training, consultation, technical assistance, translation/dissemination, program and policy development and evaluation, advocacy, and media activities, etc.), and small seed projects of less than $25,000 (total of direct and indirect costs) for one year or less.

b.Research Studies:

(1) Small studies of $25,000-150,000/year (total of direct and indirect costs) for one to three years duration. These projects might be expansions of seed projects, either further developing methods or hypotheses in preparation for a larger investigation leading to the submission of an RO1 level (investigator-initiated) proposal, or might be stand-alone investigations sufficient to yield results worthy of publication in a peer-reviewed journal and/or a technical report for a legislative body, governmental agency, or injury control program.

(2) Larger scale studies with annual budgets exceeding $150,000/year (total of direct and indirect costs) and lasting up to five years. These projects typically will test hypotheses and employ more sophisticated methodologies and/or larger sample sizes than small studies.

For seed projects, only modest budget descriptions are required within the application. More detailed budget descriptions, commensurate with costs, are required for both small studies and large research projects.

An applicant organization has the option of having specific salary and fringe benefit amounts for individuals omitted from the copies of the application which are made available to outside reviewing groups. To exercise this option: on the original and five copies of the application, the applicant must use asterisks to indicate those individuals for whom salaries and fringe benefits are not shown; however, the subtotals must still be shown. In addition, the applicant must submit an additional copy of page four of Form PHS-398, completed in full, with the asterisks replaced by the salaries and fringe benefits. This budget page will be reserved for internal staff use only.

The application should include:

- Budget for entire proposed project period including budgets pertaining to consortium/contractual arrangements.
- Biographical sketches of key personnel, consultants, and collaborators, beginning with the Principal Investigator and core faculty.
- Other support: This listing should include all other funds or resources pending or currently available. For each grant or contract include source of funds, amount of funding (indicate whether pending or current), date of funding (initiation and termination), and relationship to the proposed program.
- A description of resources and environment.
- Detailed budgetary support must be provided in the form, format, and to the level of detail as indicated in the CDC Budget Guidelines. These can be located at: http://www.cdc.gov/od/pgo/funding/budgetguide.htm

Research Plan

- ICRCs are to develop a range of research and other non-research activities that are designed to advance the field of injury control through development of new scientific or surveillance methods, creation of new knowledge, and translation of knowledge into training, program and policy development and evaluation activities or other applications that will ultimately reduce injuries or their effects. ICRC applications should articulate how the activities of their program are integrated with each other.
- A detailed research plan (design and methods) should be included, in accordance with NCIPC's performance goal, as stated in Section I. Funding Opportunity Description, 1. Research

Objectives, including hypothesis, expected outcome, value to the field, and measurable and time-framed objectives consistent with the activities for each project within the proposed grant. The focus of the research should be based on recommendations in "Healthy People 2010" (http://www.healthypeople.gov), the "CDC Injury Research Agenda" (http://www.cdc.gov/ncipc/pub-res/research_agenda.htm), and the "Acute Injury Care Research Agenda" (http://www.cdc.gov/ncipc/didop/ACRAgenda.pdf).

(1) Initial seed projects require a short write-up describing the injury control context of the study, the objective, the design, the setting and participants, the intervention being addressed, main outcome measurements, expected results, time lines, cost (total of direct and indirect costs), plans for translation/dissemination, and clear definition of procedures used to select the projects. Clear definitions of procedures used to select future out-year seed projects are also required.

(2) Small research projects require a ten to fifteen page summary describing the accomplishment of all the steps, including a description of the significance of the project, the development and testing of methods and instruments, and the collection of preliminary data needed to take an innovative approach and develop it to the level of a larger investigation leading to the submission of an RO1 level proposal or a stand-alone investigation sufficient to yield results worthy of publication in a peer-reviewed journal and/or a technical report for a legislative body, governmental agency, or injury control program.

(3) Large research projects require an RO1 level summary (investigator-initiated proposal) as described in the PHS 398 (Revised 5/01 and updated 6/28/02) guidelines. The summary should be included as an appendix of the application.

In the research plan section of the application, include the following for each small and large research project:

(a.) Title of Project
(b.) Project Director/Lead Investigator
(c.) Institution(s)
(d.) Categorization as Prevention, Acute Care, Rehabilitation, or Biomechanics
(e.) Categorization as to which NCIPC research agenda priority area the project addresses. Also, a brief description on how it addresses that priority area. If a priority area is not addressed, provide an explanation of why it is important.
(f.) Categorization as Seed Project, Small Project, or Large Project
(g.) Categorization as New or Ongoing Project
(h.) Total Cost/Year (total of direct and indirect costs)
(i.) Research Training: Names, Degrees of Persons Trained or in Training
(j.) Key Words
(k.) Brief Summary (Abstract) of Project including Intended Application of Findings

- A description of the core faculty and their roles in implementing and evaluating the proposed programs. The applicant should clearly specify how disciplines will be integrated to achieve the ICRCs objectives.
- Charts showing the proposed organizational structure of the ICRC and its relationship to the broader institution of which it is a part and, where applicable, to affiliate institutions or collaborating organizations. These charts should clearly detail the lines of authority as they relate to the center, both structurally and operationally. ICRC Directors should report to an appropriate organizational level (e.g. Dean of a school, Vice-President of a University, or Commissioner of Health), demonstrating strong institution-wide support of ICRC activities and ensuring oversight of the process of interdisciplinary activity.
- Documentation of the public health agencies and other public and private sector entities to be involved in the proposed program, including letters that detail commitments of support and a clear statement of the role, activities, and participating personnel of each agency or entity.

- ## 3. Submission Dates and Times

All requested information must be received in the CDC Procurement and Grants Office by 4:00 p.m. Eastern Time on the deadline date. If you submit your application by the United States Postal Service or commercial delivery service, you must ensure that the carrier will be able to guarantee delivery by the closing date and time. If CDC receives your submission after closing due to: (1) carrier error, when the carrier accepted the package with a guarantee for delivery by the closing date and time, or (2) significant weather delays or natural disasters, you will be given the opportunity to submit documentation of the carrier's guarantee. If the documentation verifies a carrier problem, CDC will consider the submission as having been received by the deadline.

This announcement is the definitive guide on LOI and application content, submission address, and deadline. It supersedes information provided in the application instructions. If your application does not meet the deadline above, it will not be eligible for review, and will be discarded. You will be notified that you did not meet the submission requirements.

Otherwise, CDC will not notify you upon receipt of your submission. If you have a question about the receipt of your LOI or application, first contact your courier. If you still have a question, contact the PGO-TIM staff at: 770-488-2700. Before calling, please wait two to three days after the submission deadline. This will allow time for submissions to be processed and logged.

3.A. Receipt, Review and Anticipated Start Dates

Letter of Intent Receipt Date: 08/02/2006
Application Receipt Date: 09/01/2006
Peer Review Date: 03/10/2007
Council Review Date: 04/12/2007
Earliest Anticipated Start Date: 09/01/2007

3.A.1. Letter of Intent

Prospective applicants are asked to submit a letter of intent that includes the following information:

- Descriptive title of proposed research.
- Name, address, and telephone number of the Principal Investigator.
- Names of other key personnel.
- Participating institutions.
- Number and title of this funding opportunity.

Although a letter of intent is not required, is not binding, and does not enter into the review of a subsequent application, the information that it contains allows NCIPC staff to estimate the potential review workload and plan the review.

The letter of intent is to be sent by the date listed in Section IV.3.A

The letter of intent should be sent to:

NCIPC Extramural Resources Team
CDC, National Center for Injury Prevention and Control

Address for Express Mail or Delivery Service:
2945 Flowers Road
Yale Building, Room 2054
Atlanta, Georgia 30341

Address for U.S. Postal Service Mail:

4770 Buford Hwy, NE, Mailstop K-62
Atlanta, GA 30341

Telephone: 770-488-4037
Fax: 770-488-1662
Email: CIPERT@CDC.GOV

3.B. Sending an Application

Applications follow the PHS 398 application instructions for content and formatting of your applications. If the instructions in this announcement differ in any way from the PHS 398 instructions, follow the instructions in this announcement.

Applications must be prepared using the research grant applications found in the PHS 398 instructions for preparing a research grant application. Submit a signed, typewritten original of the application and all appendices, including the checklist, and one signed photocopy in one package to:

Technical Information Management – PA CE07-001
CDC Procurements and Grants Office
2920 Brandywine Road
Atlanta, GA 30341

At the time of submission, four additional copies of the application, including the appendix material, must be sent to:

NCIPC Extramural Resources Team
CDC, National Center for Injury Prevention and Control

Address for Express Mail or Delivery Service:
2945 Flowers Road
Yale Building, Room 2054
Atlanta, Georgia 30341

Address for U.S. Postal Service Mail:
4770 Buford Hwy, NE, Mailstop K-62
Atlanta, GA 30341
Fax: 770-488-1662
Email: CIPERT@CDC.GOV

Note: Applications must be sent to CDC in Atlanta, GA not NIH in Bethesda, MD.

3.C. Application Processing

Applications must be **received on or before the application receipt date(s)** described above (Section IV.3.A.). If an application is received after that date, it will be returned to the applicant without review. Upon receipt, applications will be evaluated for completeness by the PGO and responsiveness by the NCIPC. Incomplete and non-responsive applications will not be reviewed.

4. Intergovernmental Review

Executive Order 12372 does not apply to this program.

5. Funding Restrictions

All CDC awards are subject to the terms and conditions, cost principles, and other considerations described in the PHS Grants Policy Statement.

Restrictions, which must be taken into account while writing your budget, are as follows:

- Funds relating to the conduct of research will be restricted until the appropriate assurances and Institutional Review Board approvals are in place.
- Reimbursement of pre-award costs is not allowed.
- Grant funds will not be made available to support the provision of direct care.
- Eligible applicants may enter into contracts, including consortia agreements, as necessary to meet the requirements of the program and strengthen the overall application.
- Charge back of customs and import fees is not allowed for foreign organizations.
- Administrative (indirect) costs cannot be requested by foreign organizations.

6. Other Submission Requirements

If you are requesting indirect costs in your budget, you must include a copy of your indirect cost rate agreement. If your indirect cost rate is a provisional rate, the agreement should be less than 12 months of age.

Your research plan should address activities to be conducted over the entire project period.

Plan for Sharing Research Data

The precise content of the data-sharing plan will vary, depending on the data being collected and how the investigator is planning to share the data. Applicants may wish to describe briefly the expected schedule for data sharing, the format of the final dataset, the documentation to be provided, whether or not any analytic tools also will be provided, whether or not a data-sharing agreement will be required and, if so, a brief description of such an agreement (including the criteria for deciding who can receive the data and whether or not any conditions will be placed on their use), and the mode of data sharing (e.g., under their own auspices by mailing a disk or posting data on their institutional or personal website, through a data archive or enclave). References to data sharing may also be appropriate in other sections of the application.

Note: Only proposals submitted to NCIPC for individual research projects of $500,000 or more in total (direct and indirect) costs per year require the applicant to include a data-sharing plan.

All applicants must include a plan for sharing research data in their application. The data sharing policy is available at http://www.cdc.gov/od/pgo/funding/ARs.htm under Additional Requirements 25 Release and Sharing of Data. All investigators responding to this funding opportunity should include a description of how final research data will be shared, or explain why data sharing is not possible.

The reasonableness of the data sharing plan or the rationale for not sharing research data will be assessed by the reviewers. However, reviewers will not factor the proposed data sharing plan into the determination of scientific merit or the priority score.

Sharing Research Resources

Not applicable.

Section V. Application Review Information

1. Criteria

The following will be considered in making funding decisions:

- Scientific merit of the proposed project as determined by peer review
- Availability of funds
- Relevance of program priorities

2. Review and Selection Process

Applications that are complete and responsive to the PA will be evaluated for scientific and technical merit by an appropriate peer review group convened by NCIPC in accordance with the review criteria stated below.

As part of the initial merit review, all responsive applications will:

- Undergo a selection process in which only those applications deemed to have the highest scientific merit, generally the top half of applications under review, will be discussed and assigned a priority score.
- Receive a written critique.
- Receive a second level of review by the Science and Program Review Subcommittee (SPRS) of the Secretary's Advisory Committee for Injury Prevention and Control (ACIPC).

The goals of CDC-supported research are to advance the understanding of health promotion and prevention of disease, injury, and disability, and enhance preparedness. In the written comments, reviewers will be asked to evaluate the application in order to judge the likelihood that the proposed research will have a substantial impact on the pursuit of these goals.

Significance: Does this study address an important problem? If the aims of the application are achieved, how will scientific knowledge or clinical practice be advanced? What will be the effect of these studies on the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field?

Approach: Are the conceptual or clinical framework, design, methods, and analyses adequately developed, well integrated, well reasoned, and appropriate to the aims of the project? Does the applicant acknowledge potential problem areas and consider alternative tactics? Does the project include plans to measure progress toward achieving the stated objectives? Is there an appropriate work plan included?

Innovation: Is the project original and innovative? For example: Does the project challenge existing paradigms or clinical practice; address an innovative hypothesis or critical barrier to progress in the field? Does the project develop or employ novel concepts, approaches, methodologies, tools, or technologies for this area?

Investigators: Are the investigators appropriately trained and well suited to carry out this work? Is the work proposed appropriate to the experience level of the principal investigator and other researchers? Does the investigative team bring complementary and integrated expertise to the project (if applicable)? Is there a prior history by the principal investigator of conducting injury prevention or control research?

Environment: Does the scientific environment in which the work will be done contribute to the probability of success? Do the proposed studies benefit from unique features of the scientific environment, or subject populations, or employ useful collaborative arrangements? Is there evidence of institutional support? Is there an appropriate degree of commitment and cooperation of other interested parties as evidenced by letters of support detailing the nature and extent of the involvement?

Application Review

The primary review will be a peer review conducted by NCIPC Initial Review Group (IRG). Applications may be subjected to a preliminary evaluation (streamline review) by the IRG to determine if the

application is of sufficient technical and scientific merit to warrant further review. NCIPC will withdraw from further consideration applications judged to be noncompetitive and promptly notify the principal investigator/program director and the official signing for the applicant organization. Those applications judged to be competitive will be further evaluated by the IRG. These applications will be reviewed for scientific merit using current NIH criteria (a scoring system of 100 - 500 points) to evaluate the methods and scientific quality of the application.

Competing supplemental grant awards may be made, when funds are available, to support research work or activities not previously approved by the IRG. Applications should be clearly labeled to denote their status as requesting supplemental funding support. These applications will be reviewed by the IRG and the secondary review group.

Awards will be made based on priority scores assigned to applications by the IRG, programmatic priorities and needs determined by a secondary review committee (the Advisory Committee for Injury Prevention and Control), and the availability of funds.

The IRG may recommend the application for a site visit review. For those applications recommended for a site visit review, a team of peer reviewers, including members of the IRG, will conduct on-site visits at each applicant institution, generate summary statements for the visits, and report the assessment to the IRG. Factors to be considered by the IRG include:

- The specific aims of the application, e.g., the long-term objectives and intended accomplishments. Approval of small and large research projects (including new research projects proposed during the five-year funding cycle), in accordance with NCIPC's performance goal is subject to peer review.
  a. Seed projects will be evaluated collectively on the mechanism for solicitation of projects and on their technical/scientific merit review. Evaluation criteria have equal value.
  b. Small projects will be evaluated individually on the significance of the project, the innovative approach, and the proposed methods for achieving an investigation sufficient to support a submission of an RO1 level (investigator-initiated) proposal and/or worthy of publication in a peer-reviewed journal and/or a technical report for a legislative body, governmental agency, or injury control program.
  c. Large projects will be evaluated individually according to existing RO1 level (investigator-initiated) project standards as described in the PHS 398 (Revised 5/01 and updated 6/28/02) guidelines. The application must have a minimum of one large research project approved in order to be recommended for further consideration
  d. At least 80 percent of the costs (total direct and indirect costs) of the approved small and large research projects must be in alignment with the "CDC Injury Research Agenda," http://www.cdc.gov/ncipc in order to be recommended for further consideration.
- The scientific and technical merit of the overall application, including the significance and originality (e.g., new topic, new method, new approach in a new population, or advancing understanding of the problem) of the proposed research.
- The extent to which the evaluation plan will allow for the measurement of progress toward the achievement of stated objectives. Does the application specify how the effectiveness of the program will be measured?
- Qualifications, adequacy, and appropriateness of personnel to accomplish the proposed activities.
- The soundness of the proposed budget in terms of adequacy of resources and their allocation.
- In addition to conducting defined research projects, ICRCs are expected to devote substantial attention to advancing the field through other activities that are designed to improve research capabilities and translate research into practice. Examples of activities include: consultation and technical assistance that are responsive to regional, State, national, or international priorities; professional training for researchers and practitioners; program development; and evaluation endeavors. The degree of effort devoted to these aspects of the ICRCs program should be clearly stated in the justification and the budget. The degree of effort may be varied and should reflect the specific focus and goals of the ICRC.

- Details of progress in the most recent funding period should be provided in the application if the applicant is submitting a re-competing application. Documented examples of success include: development of pilot projects; completion of high quality research projects; publication of findings in peer reviewed scientific and technical journals; number of professionals trained; awards received; ongoing provision of consultation and technical assistance; integration of disciplines; translation of research into implementation; and impact on injury control outcomes including legislation, regulation, treatment, and behavior modification interventions.

The secondary review of ICRC grant applications with a priority score of 350 or better from the initial peer-review by the IRG will be conducted by the Science and Program Review Subcommittee (SPRS) of the Advisory Committee for Injury Prevention and Control (ACIPC). The ACIPC Federal agency experts will be invited to attend the secondary review and will receive modified briefing books (i.e., abstracts, strengths and weaknesses from summary statements, and project officer's briefing materials). ACIPC Federal agency experts will be encouraged to participate in deliberations when applications address overlapping areas of research interest, so that unwarranted duplication in federally-funded research can be avoided and special subject area expertise can be shared. The NCIPC Division Associate Directors for Science (ADS) or their designees will attend the secondary review in a similar capacity as the ACIPC Federal agency experts to assure that research priorities of the announcement are understood and to provide background regarding current research activities. Only SPRS members will vote on funding recommendations, and their recommendations will be carried to the entire ACIPC for voting by the ACIPC members in closed session. If any further review is needed by the ACIPC, regarding the recommendations of the SPRS, the factors considered will be the same as those considered by the SPRS.

The ACIPC committee's responsibility is to develop funding recommendations for the NCIPC Director based on the results of the primary review, the relevance and balance of proposed research relative to the NCIPC programs and priorities, and to assure that unwarranted duplication of federally-funded research does not occur. The secondary review committee has the latitude to recommend to the NCIPC Director, to reach over better ranked proposals in order to assure maximal impact and balance of proposed research. The factors to be considered will include:

- The results of the primary review including the application's priority score as the primary factor in the selection process.
- The relevance and balance of proposed research relative to the NCIPC programs and priorities.
- The significance of the proposed activities in relation to the priorities and objectives stated in "Healthy People 2010," the "CDC Injury Research Agenda," and the "Acute Injury Care Research Agenda."
- Budgetary considerations.

All awards will be determined by the Director of the NCIPC based on priority scores assigned to applications by the primary review committee IRG, recommendations by the secondary review committee of the Science and Program Review Subcommittee of the ACIPC, consultation with NCIPC senior staff, and the availability of funds.

Continued Funding

Continuation awards made after FY 2007, but within the project period, will be made on the basis of the availability of funds and the following criteria:

- The accomplishments reflected in the progress report of the continuation application indicate that the applicant is meeting previously stated objectives or milestones contained in the project's annual work plan and satisfactory progress is being demonstrated through presentations at work-in-progress monitoring workshops (travel expenses for this annual one-day meeting should be included in the applicant's proposed budget).
- The objectives for the new budget period are realistic, specific, and measurable.
- The methods described will clearly lead to achievement of these objectives.
- The evaluation plan will allow management to monitor whether the methods are effective.
- The budget request is clearly explained, adequately justified, reasonable and consistent with the intended use of grant funds.

- The grantee has demonstrated fiscal and administrative responsibility and compliance.

2.A. Additional Review Criteria:

In addition to the above criteria, the following items will continue to be considered in the determination of scientific merit and the priority score:

Protection of Human Subjects from Research Risk: The involvement of human subjects and protections from research risk relating to their participation in the proposed research will be assessed (see the Research Plan, Section E on Human Subjects in the PHS Form 398). http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.htm**.** Additional CDC Requirements under AR-1 Human Subjects Requirements can be found on http://www.cdc.gov/od/pgo/funding/ARs.htm.

Inclusion of Women and Minorities in Research: Does the application adequately address the CDC Policy requirements regarding the inclusion of women, ethnic, and racial groups in the proposed research? This includes: (1) The proposed plan for the inclusion of both sexes and racial and ethnic minority populations for appropriate representation; (2) The proposed justification when representation is limited or absent; (3) A statement as to whether the design of the study is adequate to measure differences when warranted; and (4) A statement as to whether the plans for recruitment and outreach for study participants include the process of establishing partnerships with community(ies) and recognition of mutual benefits.

Care and Use of Vertebrate Animals in Research: If vertebrate animals are to be used in the project, the five items described under Section F of the PHS Form 398 research grant application instructions will be assessed. Additional CDC Requirements under AR-3 Animal Subjects Requirements can be found on http://www.cdc.gov/od/pgo/funding/ARs.htm.

Biohazards: If materials or procedures are proposed that are potentially hazardous to research personnel and/or the environment, determine if the proposed protection is adequate.

2.B. Additional Review Considerations

Budget: The reasonableness of the proposed budget and the requested period of support in relation to the proposed research. The priority score should not be affected by the evaluation of the budget.

2.C. Sharing Research Data

Data Sharing Plan: The reasonableness of the data sharing plan or the rationale for not sharing research data will be assessed by the reviewers. However, reviewers will not factor the proposed data sharing plan into the determination of scientific merit or the priority score. The presence of a data sharing plan will be part of the terms and conditions of the award. The funding organization will be responsible for monitoring the data sharing policy.

Note: A data sharing plan is required by NCIPC only for applications requesting total (direct and indirect) costs of $500,000 or more per year.

2.D. Sharing Research Resources

Not applicable.

3. Anticipated Announcement and Award Dates

Applicants will be notified in August or early September of 2007 by CDC's Procurement and Grants Office (PGO) if their applications were funded.

Section VI. Award Administration Information

1. Award Notices

After the peer review of the application is completed, the Principal Investigator will also receive a written critique called a Summary Statement.

Those applicants under consideration for funding will be contacted by CDC for additional information.

A formal notification in the form of a Notice of Award (NoA) will be provided to the applicant organization. The notice of award signed by the Grants Management Officer (GMO) is the authorizing document. This document will be mailed and/or emailed to the recipient fiscal officer identified in the application.

Selection of the application for award is not an authorization to begin performance. Any cost incurred before receipt of the NoA is at the recipient's risk. These costs may be reimbursed only to the extent considered allowable pre-award costs. See also Section IV.5. Funding Restrictions.

2. Administrative and National Policy Requirements

The Code of Federal Regulations 45 CFR Part 74 and Part 92 have details about policy requirements. For more information on the Code of Federal Regulations, see the National Archives and Records Administration at the following Internet address: http://www.access.gpo.gov/nara/cfr/cfr-table-search.html. The following additional requirements can be found in Section VIII. Other Information of this document or on the CDC website at the following Internet address: http://www.cdc.gov/od/pgo/funding/ARs.htm. These will be incorporated into the NoA by reference.

3. Reporting

You must provide CDC with an original, plus two hard copies of the following reports:

1. Interim/Grant Progress Report, (use form PHS 2590, OMB Number 0925-0001, rev. 9/04 as posted on the CDC website) no less than 120 days before the beginning of the budget period. The progress report will serve as your non-competing continuation application.
2. Financial status report, no more than 90 days after the end of the budget period.
3. Final financial and performance reports, no more than 90 days after the end of the project period.

These reports must be forwarded by U.S. Postal Service or Express Delivery to the Grants Management Specialist listed in the "Agency Contacts" section of this announcement.

Although the financial plans of the CIO(s) provide support for this program, awards pursuant to this funding opportunity are contingent upon the availability of funds, evidence of satisfactory progress by the recipient (as documented in required reports) and the determination that continued funding is in the best interest of the Federal government.

Section VII. Agency Contacts

We encourage your inquiries concerning this funding opportunity and welcome the opportunity to answer questions from potential applicants. Inquiries may fall into three areas: scientific/research, peer review, and financial or grants management issues:

1. Scientific/Research Contacts:

Rick Waxweiler, Ph.D.
National Center for Injury Prevention and Control
Centers for Disease Control and Prevention (CDC)
4770 Buford Highway, NE, Mailstop K-02
Atlanta, Georgia 30341
Telephone: 770-488-4823
FAX: 770-488-4422
E-mail: tdv1@cdc.gov

2. Peer Review Contacts:

Gwendolyn Cattledge, Ph.D
Scientific Review Administrator
National Center for Injury Prevention and Control
Centers for Disease Control and Prevention (CDC)
4770 Buford Highway, NE, Mailstop K-02
Atlanta, Georgia 30341
Telephone: 770-488-4655
FAX: 770-488-4422
E-mail: gxc8@cdc.gov

3. Financial or Grants Management Contacts:

Jim Masone, Grants Management Officer
CDC Procurement and Grants Office
2920 Brandywine Road
Atlanta, GA 30341
Telephone: 770-488-2736
FAX: 770-488-2671
E-mail: jmasone@cdc.gov

4. General Questions Contacts:

Technical Information Management Section
CDC Procurement and Grants Office
2920 Brandywine Road
Atlanta, GA 30341
Telephone: 770-488-2700
Email: PGOTIM@cdc.gov

Section VIII. Other Information

Required Federal Citations

Human Subjects Protection:
Federal regulations (45CFR46) require that applications and proposals involving human subjects must be evaluated with reference to the risks to the subjects, the adequacy of protection against these risks, the potential benefits of the research to the subjects and others, and the importance of the knowledge gained or to be gained (http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.htm). Additional CDC

Requirements under AR-1 Human Subjects Requirements can be found on http://www.cdc.gov/od/pgo/funding/ARs.htm.

Use of Animals in Research:
Recipients of PHS support for activated involving live, vertebrate animals must comply with PHS Policy on Humane Care and Use of Laboratory Animals(http://grants.nih.gov/grants/olaw/references/PHSPolicyLabAnimals.pdf) as mandated by the Health Research Extension Act of 1985 (http://grants.nih.gov/grants/olaw/references/hrea1985.htm), and the USDA Animal Welfare Regulations (http://www.nal.usda.gov/awic/legislat/usdaleg1.htm) as applicable. Additional CDC Requirements under AR-3 Animal Subjects Requirements can be found on http://www.cdc.gov/od/pgo/funding/ARs.htm.

Requirements for Inclusion of Women and Racial and Ethnic Minorities in Research
It is the policy of the Centers for Disease Control and Prevention (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR) to ensure that individuals of both sexes and the various racial and ethnic groups will be included in CDC/ATSDR-supported research projects involving human subjects, whenever feasible and appropriate. Racial and ethnic groups are those defined in OMB Directive No. 15 and include American Indian or Alaska Native, Asian, Black or African American, Hispanic or Latino, Native Hawaiian or Other Pacific Islander. Applicants shall ensure that women, racial and ethnic minority populations are appropriately represented in applications for research involving human subjects. Where clear and compelling rationale exist that inclusion is inappropriate or not feasible, this situation must be explained as part of the application. This policy does not apply to research studies when the investigator cannot control the race, ethnicity, and/or sex of subjects. Further guidance to this policy is contained in the Federal Register, Vol. 60, No. 179, pages 47947-47951, and dated Friday, September 15, 1995.

Paperwork Reduction Act Requirements
Under the Paperwork Reduction Act, projects that involve the collection of information from 10 or more individuals and funded by a grant or a cooperative agreement will be subject to review and approval by the Office of Management and Budget (OMB).

Smoke-Free Workplace Requirements
CDC strongly encourages all recipients to provide a smoke-free workplace and to promote abstinence from all tobacco products. Public Law 103-227, the Pro-Children Act of 1994, prohibits smoking in certain facilities that receive Federal funds in which education, library, day care, health care, or early childhood development services are provided to children.

Healthy People 2010

The Public Health Service (PHS) is committed to achieving the health promotion and disease prevention objectives of "Healthy People 2010," a PHS-led national activity for setting priority areas. This PA is related to one or more of the priority areas. Potential applicants may obtain a copy of "Healthy People 2010" at http://www.health.gov/healthypeople.

Lobbying Restrictions

Applicants should be aware of restrictions on the use of HHS funds for lobbying of Federal or State legislative bodies. Under the provisions of 31 U.S.C. Section 1352, recipients (and their sub-tier contractors) are prohibited from using appropriated Federal funds (other than profits from a Federal contract) for lobbying congress or any Federal agency in connection with the award of a particular contract, grant, cooperative agreement, or loan. This includes grants/cooperative agreements that, in whole or in part, involve conferences for which Federal funds cannot be used directly or indirectly to encourage participants to lobby or to instruct participants on how to lobby.

In addition no part of CDC appropriated funds, shall be used, other than for normal and recognized executive-legislative relationships, for publicity or propaganda purposes, for the preparation, distribution, or use of any kit, pamphlet, booklet, publication, radio, television, or video presentation designed to support or defeat legislation pending before the Congress or any State or local legislature, except in presentation to the Congress or any State or local legislature itself. No part of the appropriated funds shall be used to pay the salary or expenses of any grant or contract recipient, or agent acting for such recipient, related to any activity designed to influence legislation or appropriations pending before the Congress or any State or local legislature.

Any activity designed to influence action in regard to a particular piece of pending legislation would be considered "lobbying." That is lobbying for or against pending legislation, as well as indirect or "grass roots" lobbying efforts by award recipients that are directed at inducing members of the public to contact their elected representatives at the Federal or State levels to urge support of, or opposition to, pending legislative proposals is prohibited. As a matter of policy, CDC extends the prohibitions to lobbying with respect to local legislation and local legislative bodies.

The provisions are not intended to prohibit all interaction with the legislative branch, or to prohibit educational efforts pertaining to public health. Clearly there are circumstances when it is advisable and permissible to provide information to the legislative branch in order to foster implementation of prevention strategies to promote public health. However, it would not be permissible to influence, directly or indirectly, a specific piece of pending legislation

It remains permissible to use CDC funds to engage in activity to enhance prevention; collect and analyze data; publish and disseminate results of research and surveillance data; implement prevention strategies; conduct community outreach services; provide leadership and training, and foster safe and healthful environments.

Recipients of CDC grants and cooperative agreements need to be careful to prevent CDC funds from being used to influence or promote pending legislation. With respect to conferences, public events, publications, and "grassroots" activities that relate to specific legislation, recipients of CDC funds should give close attention to isolating and separating the appropriate use of CDC funds from non-CDC funds. CDC also cautions recipients of CDC funds to be careful not to give the appearance that CDC funds are being used to carry out activities in a manner that is prohibited under Federal law.

Prohibition on Use of CDC Funds for Certain Gun Control Activities

The Departments of Labor, Health and Human Services, and Education, and Related Agencies Appropriations Act specifies that: "None of the funds made available for injury prevention and control at the Centers for Disease Control and Prevention may be used to advocate or promote gun control."

Anti-Lobbying Act requirements prohibit lobbying Congress with appropriated Federal monies. Specifically, this Act prohibits the use of Federal funds for direct or indirect communications intended or designed to influence a member of Congress with regard to specific Federal legislation. This prohibition includes the funding and assistance of public grassroots campaigns intended or designed to influence members of Congress with regard to specific legislation or appropriation by Congress.

In addition to the restrictions in the Anti-Lobbying Act, CDC interprets the language in the CDC's Appropriations Act to mean that CDC's funds may not be spent on political action or other activities designed to affect the passage of specific Federal, State, or local legislation intended to restrict or control the purchase or use of firearms.

Small, Minority, And Women-owned Business

It is a national policy to place a fair share of purchases with small, minority and women-owned business firms. The Department of Health and Human Services is strongly committed to the objective of this policy and encourages all recipients of its grants and cooperative agreements to take affirmative steps to ensure such fairness. In particular, recipients should:

1. Place small, minority, women-owned business firms on bidders mailing lists.
2. Solicit these firms whenever they are potential sources of supplies, equipment, construction, or services.
3. Where feasible, divide total requirements into smaller needs, and set delivery schedules that will encourage participation by these firms.

4. Use the assistance of the Minority Business Development Agency of the Department of Commerce, the Office of Small and Disadvantaged Business Utilization, DHHS, and similar state and local offices.

Proof of Non-profit Status

Proof of nonprofit status must be submitted by private nonprofit organizations with the application. Any of the following is acceptable evidence of nonprofit status: (a) a reference to the applicant organization's listing in the Internal Revenue Service's (IRS) most recent list of tax-exempt organizations described in section 501(c)(3) of the IRS Code; (b) a copy of a currently valid IRS tax exemption certificate; (c) a statement from a State taxing body, State Attorney General, or other appropriate State Official certifying that the applicant organization has a nonprofit status and that none of the net earnings accrue to any private shareholders or individuals; (d) a certified copy of the organization's certificate of incorporation or similar document that clearly establishes nonprofit status; (e) any of the above proof for a State or national parent organization and a statement signed by the parent organization that the applicant organization is a local nonprofit affiliate.

Research Integrity

The signature of the institution official on the face page of the application submitted under this Program Announcement is certifying compliance with the Department of Health and Human Services (DHHS) regulations in 42 CFR Part 93 entitled "Responsibility of PHS Awardee and Applicant Institutions for Dealing with and Reporting Possible Misconduct in Science."

The regulation places several requirements on institutions receiving or applying for funds under the PHS Act that are monitored by the DHHS Office of Research Integrity's (ORI) Assurance Program.

For examples:

Section 50.103(a) of the regulation states: "Each institution that applies for or receives assistance under the Act for any project or program which involves the conduct of biomedical or behavioral research must have an assurance satisfactory to the Secretary (DHHS) that the applicant: (1) Has established an administrative process, that meets the requirements of this subpart, for reviewing, investigating, and reporting allegations of misconduct in science in connection with PHS-sponsored biomedical and behavioral research conducted at the applicant institution or sponsored by the applicant; and (2) Will comply with its own administrative process and the requirements of this Subpart."

Section 50.103(b) of the regulation states that: "an applicant or recipient institution shall make an annual submission to the [ORI] as follows: (1) The institution's assurance shall be submitted to the [ORI], on a form prescribed

by the Secretary,...and updated annually thereafter...(2) An institution shall submit, along with its annual assurance, such aggregate information on allegations, inquiries, and investigations as the Secretary may prescribe."

An additional policy is added in the year 2000 that "requires research institutions to provide training in the responsible conduct of research to all staff engaged in research or research training with PHS funds.

Health Insurance Portability and Accountability Act Requirements
Recipients of this grant award should note that pursuant to the Standards for Privacy of Individually Identifiable Health Information promulgated under the Health Insurance Portability and Accountability Act (HIPAA) (45 CFR Parts 160 and 164) covered entities may disclose protected health information to public health authorities authorized by law to collect or receive such information for the purpose of preventing or controlling disease, injury, or disability, including, but not limited to, the reporting of disease, injury, vital events such as birth or death, and the conduct of public health surveillance, public health investigations, and public health interventions. The definition of a public health authority includes a person or entity acting under a grant of authority from or contract with such public agency. CDC considers this project a public health activity consistent with the Standards for Privacy of Individually Identifiable Health Information and CDC will provide successful recipients a specific grant of public health authority for the purposes of this project.

Release and Sharing of Data
The Data Release Plan is the Grantee's assurance that the dissemination of any and all data collected under the CDC data sharing agreement will be released as follows:

a. In a timely manner.
b. Completely, and as accurately as possible.
c. To facilitate the broader community.
d. Developed in accordance with CDC policy on Releasing and Sharing Data.

April 16, 2003, http://www.cdc.gov/od/foia/policies/sharing.htm and in full compliance with the 1996 Health Insurance Portability and Accountability Act (HIPPA), (where applicable), The Office of Management and Budget Circular A110, (2000) revised 2003, www.whitehouse.gov/omb/query.html?col=omb&qt=Releasing+and+Sharing+of+Data and Freedom of Information Act (FOIA) www.4.law.cornell.edu/uscode/5/5/552/html

Applications must include a copy of the applicant's Data Release Plan. Applicants should provide CDC with appropriate documentation on the reliability of the data. Applications submitted without the required Plan may be ineligible for award. Award will be made when reviewing officials have approved an acceptable Plan. The successful applicant and the Program Manager will determine the documentation format. CDC recommends data

is released in the form closest to micro data and one that will preserve confidentiality.

Note: Only proposals submitted to NCIPC for individual research projects of $500,000 or more in total (direct and indirect) costs per year require the applicant to include a data-sharing plan.

Appendix B: Success Stories

Iowa Injury Prevention Research Center

Watching a Seed Grow: Road Traffic Safety and Simulation Research

Iowa Injury Prevention Research Center

"In 1990, a group of engineers at the University of Iowa got their hands on a used motion base from a military surplus flight simulator. These clever engineers sought to find a way to reuse this motion base," proudly boasts the Iowa Injury Prevention Research Center (IPRC) Director, Corinne Peek-Asa. "One of the engineers happened to have connections with the IPRC. He was the common thread that brought the Center together with the College of Engineering to undertake what ultimately became some of the most successful Center research, resulting in the development of an instrumented vehicle that could be used for driving simulation activities." The Iowa Driving Simulator (IDS) can be used to determine visual impairment, response time, and other psychological components associated with driving. This is critically important as between 2002 and 2006 motor vehicle traffic-related trauma was the leading cause of injury death in Iowa, the third leading cause of hospitalizations, and the second leading cause of emergency department visits.[23]

The simulator consists of a dome with a vehicle cab inside. The vehicle is attached to a motorized turntable that allows the dome to rotate and simulate different driving conditions.

One of the requirements of CDC-funded ICRCs is that they fund seed projects. These seed projects allow researchers to pilot test ideas and gather preliminary data. In 1993, faculty at the Center learned about the IDS and sought to determine if the instrument could be used to measure driving performance, specifically among the elderly. These researchers put together a proposal for a seed grant and the Center funded their project to study driving performance among elderly for this purpose. Their research would assess the ability of the simulator to measure driving performance based on tests of patients driving on the streets and in the simulator. Following the initial seed pilot project, the Center used evidence from the project, and successfully competed for an R01 individual researcher grant addressing driving characteristics of patients in the early stages of Alzheimer's disease. Alzheimer's disease is the most common cause of dementia and impairs cognitive skills necessary for driving. The Center's research included a case-controlled study that demonstrated, through driving simulation, the risks associated with driving for persons in the early stages of the disease. The work also demonstrated that high fidelity simulation can accurately measure driving performance in a safe environment. This project's success would not have been possible without the data gathered from the initial seed project on elderly driving.

Multi-disciplinary Research

Interest in this technology soon grew. Health-related investigators across the campus became interested in looking at various issues related to driving using the simulator. In 1994, the Center appointed associate director for Acute Care Dr. James Torner to serve as the designated health science representative to the College of Engineering to

[23] Iowa Department of Public Health, *The Burden of Injury in Iowa, Comprehensive Injury Report, 2002-2006*. December 2008.

coordinate research related to driving simulation. Simulation research required the researcher to strip the research down to the most specific foci possible. This work requires collaboration between computer science, graphic design, medical professionals, and engineers; such collaboration, including the involvement from the Iowa Injury Prevention Research Center, created protocols that have launched several important research projects over time.

Growing the Seed

IPRC leaders knew that this technology had immense potential. In an effort to grow this research beyond the initial seed funding and promote the technology at the national level, the Center worked to obtain dedicated federal funding for the simulator. They sponsored a symposium in 1994 for leaders from CDC and the National Highway Traffic Safety Administration (NHTSA) to highlight the potential of the simulation technology. NHTSA recognized the potential of this technology and in 1997 funded a $50 million effort to construct a national advanced driving simulator. University of Iowa competed and won the award to serve as the site for the national advanced driving simulator.

Meanwhile, in 2000, Center researcher Matthew Rizzo was able to build his own driving simulator at the hospital. “Matt actually cut a car in pieces and carried it down to the basement of the hospital. It’s not like he could fit a whole car into a service elevator,” said Peek-Asa. Research using the hospital-based simulator identified young drivers as a population overrepresented in crash data. Another Center researcher, Daniel McGehee, developed a relationship with a company that was using an in-vehicle camera system to measure driving performance and distraction. The camera system was only being used in commercial applications, but the Center saw the potential for a good tool to monitor young driver performance. Center researchers have since conducted a pilot study with a local rural high school. IPRC has been involved in other policy-related young driver activities as well.

Center researchers are currently using the driving simulator to study driver impairment, self-awareness, and crash risk for individuals with Obstructive Sleep Apnea Syndrome (OSAS). The techniques used in this study could ultimately be adapted to develop future tools for screening, identifying, advising, and alerting drivers with OSAS who are at greater risk for impaired driving due to drowsiness, cognitive dysfunction, and lack of insight into their impairment. Other examples of IPRC-funded simulator studies have addressed return to driving after mild-moderate head injury among persons being treated for seizure disorders and persons wearing a cervical collar.

Harvard Injury Prevention and Research Center

Leadership and Synergy: The National Violent Death Reporting System

David Hemenway, director of Harvard's Injury Control Research Center (HICRC), knew that firearms were the second leading cause of injury deaths in the 1990s, but lacked good data on the circumstances of many of these injuries. To solve the problem, Harvard injury researchers in collaboration with other ICRC leaders began working on a plan to link a number of data sets to build a reporting system to capture data on violent deaths. Hemenway and two other HICRC scientists, Matthew Miller and Deborah Azrael, also published a long series of seminal papers on the association between firearm ownership and suicide risk at the ecologic level. The series included a synthesis of the case control and ecologic literature in this area.

In 1999, HICRC spearheaded a multi-million dollar project to design and test the pilot for what is now known as the National Violent Death Reporting System (NVDRS).

Initial funding for this project was not from CDC, but from a coordinated effort by Harvard to secure funding from private foundations. Harvard attributes their ability to secure this funding to the fact that they were an established Center. "Success breeds success, and the foundations wanted to fund Harvard because the Center is not just one or two researchers, but an entity that can not only do the research, but can promote the work and grow the system," said Hemenway. The leveraged dollars ultimately came from the Annie E. Casey Foundation; Atlantic Philanthropies; the Center on Crime, Communities and Culture of the Open Society Institute; the David and Lucile Packard Foundation; the John D. and Catherine T. MacArthur Foundation; and the Joyce Foundation. Harvard worked with ten pilot sites around the country to develop the system, including a site at the Medical College of Wisconsin. Center leaders at the CDC-funded Johns Hopkins University ICRC, University of California, San Francisco, and University of California, Los Angeles were also involved in the development and implementation of this program. Collectively, these injury leaders developed a reporting system designed to collect objective, ongoing data for use in planning and evaluating policies aimed at reducing violent deaths.

The system was modeled after the National Highway Traffic Safety Administration's Fatality Analysis Reporting System (FARS), which is designed to collect detailed data on motor vehicle deaths. It also builds on models developed by the University of Utah, San Francisco Health Department, the Medical College of Wisconsin and other sites participating in the pilot. The National Violent Injury Statistics System (NVISS) collected existing data from death certificates, coroner/medical examiner reports, police reports, and crime laboratories. The NVISS also collected data on victims and offenders, including data on demographics, substance use, circumstances leading to the injury, and weapon type. For suicide deaths, information is collected on the victim's physical

and mental health, substance abuse problems, treatment history, and life crises at the time of the event.

HICRC also led the science arm of a three-way partnership (with a communications firm and public health advocacy group) to build support for federal funding for the system. In 2000, Harvard and the Joyce Foundation convened an expert meeting and suggested that CDC develop a publicly funded system based on the NVISS. With support from injury leadership at Harvard and other injury centers, CDC took on the effort, which culminated in the establishment of the NVDRS. CDC's National Center for Injury Prevention and Control now collects all data for the system.

There are currently 17 states funded to use the NVDRS. The goal is to ultimately fund NVDRS in all 50 states and the District of Columbia to collect data related to violent deaths.

Southern California Injury Prevention Research Center

Building the Case for Motorcycle Helmet Laws

When Governor [George] Deukmejian signed into law a mandatory motorcycle helmet law for California in 1991, the history of statewide evaluation of such laws was non-existent," explains Dr. Jess Krauss of the [UCLA] Southern California Injury Prevention Research Center (SCIPRC) While there had been some attempts to look at local impact effects, no such research had been conducted at the state level.

The Research

Upon learning that the law would become effective January 1, 1992, researchers at the SCIPRC developed a study to determine if the law resulted in reduced mortality and head injury from motorcycle crashes, by examining such crashes before and after the law went into effect. In order to evaluate the law, the Center developed a study design that looked at statewide mortality changes and then examined crash rate information for a sample of 28 counties, as well as 30 hospitals throughout the state in counties with the highest motorcycle registrations. A parallel study was conducted by Dr. Wendy Max, a researcher at the San Francisco Injury Center, analyzing costs associated with the law, using a database developed by SCIPRC. Preparation for the study was lengthy, and included collaboration with the Department of Motor Vehicles, Department of Highway Patrol, California Hospital Association, and each individual hospital participating in the project. While preparing for the crash and medical information retrieval, the Center began a field survey of helmet use. The survey was conducted May 1991 through December 1991 in advance of the passage of the law, and January 1992 through December 1992 in order to measure the changes in helmet use at various highway, freeway, and city street locations. In March 1992, the Center researchers began gathering crash information through collaboration with the state Department of Motor Vehicles, and abstracting medical records, death certificates, and coroner information from the 28 participating counties. At the start of the project, SCIPRC was in its third year of CDC-ICRC funding. Funding for the project was provided by CDC-ICRC and a 3-year grant from the Insurance Institute for Highway Safety, which was used primarily to support the field work.

The Obstacles

SCIPRC faced their first obstacle in 1993 when various organizations began to voice opposition to the law. Among those organizations was American Brotherhood Aimed Towards Education (ABATE), a national motorcycle group. ABATE demanded that SCIPRC immediately supply them with all data and results. The Center followed standard scientific protocols of evaluation, and after analyzing the data, produced a press release showing a 50% reduction in fatalities and a nearly 60% reduction in serious head injuries in instances where helmets were used. The data were published in

the *Journal of the American Medical Association (JAMA),* and this article was immediately followed with letters to the editor from members of ABATE claiming that the information was not valid. Moreover, as the lead researcher on the project, Dr. Jess Krauss received several threats in the mail, and demands from ABATE that he be terminated from his position.

The next major obstacle came in 1994 with the first attempt to rescind the motorcycle law. SCIPRC researchers made several trips to the state capitol in Sacramento to provide testimony to the Transportation Subcommittee, and in conjunction with the data from Dr. Wendy Max's cost study, legislators simply questioned why the law had not been in existence earlier. Legal attempts to rescind the law continued nearly every year for the next 10 years. One such attempt occurred in Orange County, where a member of the Seik religion filed suit claiming the law was a violation of his religion as he was unable to wear a turban and a helmet at the same time. The claim was quickly thrown out by the judge. Another attempt was by a legislator whose home district was in northern San Diego County; he waved a letter from the National Kidney Association in front of the main legislature, claiming that the helmet law resulted in a dire deficiency for human transplants.

The Outcomes

Despite obstacles and opposition, the law remained in place, which the SCIPRC attributes to their work in conjunction with Dr. Max's cost data. There have not been any attempts to rescind the law in recent years, and all subsequent governors have been firm in refusing to rescind the helmet law.

Harborview Injury Prevention and Research Center:
Child Booster Seat Research Saves Lives

Public Health Issue

Motor vehicle crashes are the leading cause of death for children ages 5–14. In 2005, 842 children who were 14 and younger were killed and 178,000 children were injured in 2007 as occupants during motor vehicle crashes. The total lifetime cost of child and adolescent injury in the year 2000 was $34.6 billion, with over $5 billion of that amount due to motor vehicle injuries among 5–14-year-olds. Injuries of the head, neck, and spine, in addition to abdominal and internal organ damage, are all tragedies that can occur when children ages 4–8 are not in booster seats or are wearing only adult seatbelts as a safety device. Children in this age group are often too large to fit into a child restraint seat and too small to use a regular seatbelt. Children who are restrained by adult seatbelts too early are four times more likely to be injured than children in child passenger safety seats or booster seats. Booster seats provide the added height or "boost" that children need so that the adult-sized seatbelts are positioned properly across their smaller bodies. Led by Dr. Beth Ebel, researchers at the Harborview Injury Prevention and Research Center (HIPRC) in Seattle have increased awareness of the importance of seating children ages 4–8 in booster seats. Dr. Ebel and HIPRC faculty are helping people recognize that booster seats prevent severe injuries and even death.

> *"Booster seats are inexpensive and easy to use," says Dr. Ebel. "Our campaign let parents know that children between 4 and 8 need a booster seat so that the car's seat belt can fully protect them in a crash."*
> **– Beth Ebel, MD, MSc, MPH**
> **HIPRC Director & Lead Research Investigator**

Successful Outcomes

Dr. Ebel and her colleagues gathered a diverse group of community members in Seattle to form a coalition to develop a multi-faceted booster seat campaign. The goals of the campaign were to increase parent's awareness of the need for booster seats, reduce their motivational and financial barriers to purchasing a seat, and reinforce booster seat use through public health messages delivered from multiple sources. HIPRC researchers conducted focus groups before the campaign to measure parents' beliefs and behaviors toward booster seat usage. This information guided development of relevant, consistent, and culturally appropriate messages. The campaign included community partnerships, radio messages, television ads, flyers distributed at clinics, childcare centers and schools, and discount coupons for booster seats. The booster seat campaign was successful at increasing booster seat use in target communities. From January 2000 to March 2001, HIPRC researchers conducted a study to evaluate the booster seat campaign. The rates of observed booster seat use in the intervention communities doubled from 13% to 26%, a significant rise in booster seat usage over 15 months, as compared to the usage rate of control communities. As a next step, the researchers worked with state partners to

design innovative ways to reach Latino families with the message. Dr. Ebel and the HIPRC continue their partnership with state organizations to plan, develop, implement, and evaluate a campaign to increase child passenger safety practices among Latino families—supported by a grant from the Centers for Disease Control and Prevention's National Center for Injury Prevention and Control. Materials developed in this campaign are widely available throughout Washington State and on the campaign websites (www.boosterseat.org and www.abrochatuvida.org).

Effect on Public Policy

Dr. Beth Ebel and the HIPRC faculty worked with community partners and parent advocates to pass the first booster seat law in the country in Washington State. This law was named after Anton Skeen, a young boy who was killed when he was ejected from his seat belt. HIPRC contributed to Washington's strengthened booster seat law passed in 2007, which now covers children under 8 years of age who are under 4'9" in height. As of 2007, booster seat laws have been adopted in 38 states and the District of Columbia.

Appendix C: Portfolio Evaluation Methodology

Portfolio Evaluation Methodology

Introduction

The information presented in this report is the product of an evaluation of the Injury Control Research Center (ICRC) portfolio in the Office of the Director in the National Center for Injury Prevention and Control (NCIPC) at the Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services. The evaluation team (a partnership between internal NCIPC staff and The MayaTech Corporation) conducted the ICRC Portfolio Evaluation between October 2007 and April 2009. This appendix explains and expands on the research methods used to conduct this portfolio evaluation.

Scope of the Evaluation

The *CDC Framework for Program Evaluation in Public Health*[24] provided the conceptual parameters used to plan and implement the portfolio evaluation. The six steps of the framework are to 1) engage stakeholders, 2) describe the program, 3) focus the evaluation design, 4) gather credible evidence, 5) justify conclusions, and 6) ensure use and share lessons learned. The first four steps are reflected in this report as the result of an assessment plan that included administrative and project document reviews, individual ICRC site visits, in-depth interviews with ICRC directors and CDC staff, and success story interviews. Qualitative data analytic tools and bibliometric analyses were used to examine the data. The last two steps will be accomplished when these findings are presented to the NCIPC Board of Scientific Counselors for critical review and the board's subsequent recommendations for program improvement are implemented.

The *evaluand* in this study is the overall CDC-funded research center program rather than the individual Injury Control Research Centers and projects housed in the centers. The overarching goals of the ICRC portfolio evaluation are as follows:

- Assess the relevance, quality, and significance of ICRC activities and outcomes;
- Highlight success stories over the course of the program; and
- Identify research and programmatic gaps and foci for guiding NCIPC policy, funding, and staffing decisions.

In order to meet these objectives, the ICRC Portfolio Evaluation Team used a multipronged approach to obtain information for the evaluation:

- **Logic Model Development and Document Review**: The evaluation team reviewed background information in order to inform the development of the logic models.
- **ICRC Portfolio Evaluation Workgroup (IPEW):** This workgroup consisted of 10 participants from NCIPC and other parts of CDC and 2 ICRC staff members with

[24] Centers for Disease Control and Prevention. Framework for Program Evaluation in Public Health. *MMWR* 1999;48(No. RR-11).

backgrounds in injury research and program evaluation. The purpose of the workgroup was to provide feedback and recommendations on the planning and implementation of the portfolio evaluation.

- **ICRC Site Visits**: The evaluation team conducted site visits with two ICRCs in order to inform the development of the interview protocol and information-collection questionnaire.
- **In-Depth Interviews with ICRC Directors**: The ICRC Portfolio Evaluation Team obtained the majority of the data through in-depth telephone interviews with ICRC directors and other key staff using a questionnaire that was developed for this study.
- **Interviews with CDC Staff:** Nine former and current staff persons with historical and current knowledge about the ICRC program participated in a series of interviews.
- **Success Story Development:** As a way to highlight some of the pivotal work that has been conducted by the ICRC programs, the ICRC Portfolio Evaluation Team collected additional data to develop five success stories.
- **Bibliometric Analysis:** The evaluation team conducted searches of PubMed and the Web of Science (WoS) to complement the in-depth interviews and to obtain additional information relative to the projects and their potential impact on the injury prevention field.

Study Population and Inclusion/Exclusion Criteria

At the start of the evaluation, 14 ICRCs had received funding through the CDC ICRC program. However, only 12 of those centers participated in the evaluation; the two excluded centers had been funded for less than one year at the start of the evaluation. The evaluation team, together with the IPEW, determined that those centers were too early in their funding to be able to provide meaningful data that would address the objectives of the evaluation.

Logic Model Development and Document Review

Logic models translate the dynamic interactions of complex programs into domains that clearly and accurately describe the programmatic resources, activities, outputs, and outcomes. Key stakeholders, including NCIPC leadership and staff, ICRC directors, and evaluation experts, identified critical research questions and worked with the evaluation team to develop logic models that describe the program and evaluation outcomes. The evaluation team first developed the Funding Opportunity Announcement (FOA) Logic Model, which describes the major program components as stated in six of the most recent ICRC FOAs. In reviewing the ICRC funding applications and discussing the ICRCs with center directors and CDC staff, the evaluation team concluded that the centers were doing more than what was required of them through the FOA. The evaluation team developed a second model, the ICRC Implementation Logic Model, on the basis of a review of various existing documents, including center reports, Web sites, past applications, and fiscal data, in order to illustrate the ICRC program as implemented by the centers.

ICRC Site Visits

The purpose of the site visits to two ICRCs was to improve the internal validity of the in-depth interview questionnaire through the process of uncovering information and insights related to center staff members' and researchers' experiences, operations, and collaboration with communities and partners. During the two-day site visits, the evaluation team interviewed many individuals from the ICRCs and partners of the ICRCs individually and in small groups. Site visit interviews collected information about 1) the nature of the grantees' research, 2) research methodologies used, 3) goals of the ICRC and individual project research, 4) research team structure and coordination within the ICRC; 5) project outputs, including, for example, presentations and publications, and 6) future injury research needs and the future role of ICRCs. The ICRC Portfolio Evaluation Team used data collected from the site visits to inform the development of the in-depth interview questionnaire. Data from the two site visits also were analyzed and included in the final report.

ICRC In-Depth Interviews

Each of the 12 ICRCs participated in in-depth telephone interviews. The directors and up to two other key staff at the 12 ICRCs were interviewed. The interviews lasted approximately two hours and included discussions and data collection using the previously developed protocol and questionnaire. The evaluation team developed the questionnaire on the basis of the ICRC implementation logic model, site visit data, and input from key NCIPC staff. The IPEW reviewed a draft of the questionnaire and provided feedback, which was incorporated as appropriate. The interviews yielded highly qualitative and detailed data about 1) research priorities and activities, 2) funding, 3) factors that promote injury research, 4) center evaluation, and 5) future directions. Although the data collection primarily took place during the telephone interview, center directors were asked to submit a list of their 15 most influential publications to the evaluation team in advance of the interview. These publication lists were used as the basis for the bibliometric analyses.

In addition, the evaluation team asked center directors to submit additional comments in writing within one week after the interview. The additional comments were to augment the data collected during the interview; they were not intended to repeat or revise data collected during the interview.

A lead interviewer and note taker conducted each interview and generated detailed notes following the completion of each interview. These notes informed the development of the final evaluation report.

Interviews with CDC Staff

Nine former and current CDC staff participated in 30- to 60-minute interviews with the evaluation team. These individuals possessed insights into the goals and operations of the ICRC

portfolio over the course of the program's 20-year history. The goal of the interviews was to build an understanding of the "insider" perspective on the role and functioning of the ICRC program. This perspective provided information on how past and current staff at NCIPC view the ICRC program and its contributions to CDC's goals. The information from these interviews was combined with the in-depth interview data and other data to provide a comprehensive perspective around various themes and foci.

Success Story Development

In order to complement the information gleaned from the telephone interviews and highlight examples of the work being done at the centers, the evaluation team identified five examples of significant ICRC contributions to the injury prevention and control field to develop into success stories for the final report. These examples included the following topics: 1) policy activities, 2) training activities, 3) synergistic collaborations across centers, 4) seed project research that grew to full implementation and injury prevention work, and 5) research that moved through the public health research spectrum. The evaluation team developed these success stories through analysis of the telephone interview notes and secondary data collection from publicly available materials. Follow-up telephone interviews were planned for those centers selected for a success story, but a follow-up call was only needed for one of the centers in order to obtain details for the development of their success story.

Project Impact-Related Database Searches

In both the FOA and Implementation logic models, the evaluation team identified scientific publications as a major output of the ICRC program. The team conducted a bibliometric analysis of the top 15 most influential publications of each center, as identified by the centers. This bibliometric analysis enabled the team to assess the reach of the ICRC research into the injury prevention and control field.

To support the evaluation activities and in-depth interview findings, the evaluation team searched three databases: PubMed, CRISP, and Web of Science. Upon completion of the interviews, the team searched the PubMed database to verify the published peer-reviewed literature citations included in the respondents' answers. In some cases, respondents only provided citations to a fraction of the number of articles that they stated were published. The team only compiled and verified data for the citations provided by the respondents. Thus, for example, if a respondent indicated that the center had published 10 articles but only provided three citations, the team only validated and included information for the three citations as variables in the study.

In addition, for the instances where centers provided citations to peer-reviewed articles emanating from their CDC-funded study, we searched the Web of Science (WoS) to obtain the publication impact factors and data on the number of citations to the reported journal articles. Impact factors are compiled by Thomson's™ Institute for Scientific Information (ISI)® and are available through the *Journal Citation Reports*® and WoS. Impact factors are a measure of the

frequency a typical article in a particular journal is cited within a given year or period. Impact factors have utility as a measurement of quality,[25] but they should be used with careful regard for the many factors that influence citation patterns. As of this writing, impact factors were only available from WoS for 1997 through 2007. For science journal articles published before 2002, the earliest year included in the Science Journal Citations Report database, the evaluation team defaulted to the 2002 journal impact factor. For social science journal articles published before 2003, the earliest year included in the Social Science Journal Citations Report database, the team defaulted to the 2003 journal impact factor. Three journals were not incorporated into the Science Journal Citations Report database until 2004: *Injury Prevention,* the *International Journal of Occupational and Environmental Health,* and the *Journal of Interpersonal Violence.* For eight publications published in these journals before 2004, we defaulted to the 2004 impact factor measurements. Instances where an article was published in a journal outside the WoS date range, the impact factor for the closest available year was recorded. Where impact factor information was otherwise not available for a particular article or publication, the publication was not included in the bibliometric analysis.

Analytic Methods

The team managed and analyzed qualitative data collected from the two ICRC site visits using QSR NUD*IST version 5.0 qualitative software. The team focused the analyses of these data on extraction of common and divergent themes and on correlations of themes with center activities, output, and outcomes. Common themes indicated a domain of critical importance. Conversely, uncommon themes tended to indicate a unique perspective or a new insight. This thematic analysis provided critical insights for development of the in-depth interview questionnaire.

The team used Microsoft EXCEL to manage and analyze the data collected from the in-depth interviews with the ICRCs and the interviews with current and former CDC staff. The team used content analyses to summarize these qualitative data for inclusion in the report and conducted statistical analyses of the limited quantitative data as a supplement. The team focused the quantitative analysis on descriptive statistics such as frequencies and percentages.

As noted earlier, the evaluation team gathered the bibliometric information using data from the in-depth interviews and from outside sources such as the WoS database. This information is subject to the limitations described above in this appendix under the heading “Project Impact-Related Database Searches.”

Study Limitations

As with any evaluation, the evaluation team recognized several limitations that might bias or influence these findings. First, this evaluation was conducted to highlight successes and challenges faced by the centers and identify areas for program improvement. It was never intended as an inventory of all activities, projects, and services conducted by the ICRCs and

[25] Borgman, C.L., & Furner, J. (2002). Scholarly Communication and Bibliometrics. In B. Cronin (Ed.), *Annual Review of Information Science and Technology, Vol 36.* Medford, NJ: Information Today, pp 3–72.

should not be viewed as such. Because of the long center history, the many changes in center leadership over that history, differences in funding cycles, and difficulty defining key activities, the evaluation team did not collect much quantitative data and, therefore, did not provide counts of activities such as trainings and service activities. Because this program is for "center" funding, it is also impossible to attribute all center activities to the CDC ICRC program funding. The centers rely on many sources of funding, and research or activities cannot be tied to individual sources of funding. As a qualitative study, the evaluation team's understanding of the ICRC program was built as the team conducted the evaluation. As a result, the team asked centers who were interviewed later in the process more follow-up questions. The team interpreted concepts such as training and funding differently because of each center's particular perspective. While the team tried to operationalize these terms as much as possible, centers often did not have the data available to answer a question as the evaluation team had defined it. For their training purposes, for example, some centers count all students who are enrolled in injury-specific classes, but others limit their count to those who write an injury-related thesis or dissertation. Finally, because the ICRC program is a competitively funded program, the centers had every incentive to promote themselves during this evaluation, although the grant review process and the portfolio evaluation process were completely separate.

Appendix D: Information Collection Instruments

ICRC SITE VISIT INTERVIEW PROTOCOL
(Sent to and Used with the Two Participating ICRCs)

Introduction/Overview

In January 2005, in order to comply with CDC's policy on Peer Review of Research, CDC's National Center for Injury Prevention and Control (NCIPC) began a multi-year process to evaluate its research portfolios. We are now in the process of a portfolio evaluation of the Injury Control Research Centers (ICRCs) funded by CDC. This portfolio evaluation intends to: 1) assess the relevance, quality, and significance of ICRC activities and outcomes; 2) highlight case studies/success stories over the course of the portfolio; and 3) identify research and programmatic gaps and foci that may be useful for guiding NCIPC policy, funding, and staffing decisions.

We want to emphasize that this evaluation is focused on the overall research center program rather than the individual centers and projects housed in the centers.

We are collecting information about: 1) the goals and operations of the ICRC; 2) research planning and implementation; 3) coordination and partnering internal and external to the ICRC; 4) center outputs and outcomes, including, for example, training of new injury prevention professionals, injury prevention programs and policies, and behavior change interventions; 5) ICRCs' roles in addressing future injury research needs; and 6) CDC technical assistance for ICRCs. The information gathered during this site visit will help inform the survey that will be used to evaluate the ICRCs. In addition, information gathered during the site visit will be used to inform the final evaluation report. Finally, it is our hope that information collected during this site visit will help illustrate how the ICRCs are building the field of injury prevention and control.

Thank you once again for agreeing to take the time to participate. If you have questions at any point during the site visit, please ask.

A. Management and Administration

1) Describe the management structure within your center.

2) How and/or why was this structure developed?

3) How does this structure affect interdisciplinary relationships?
   a) Leadership and other researchers
   b) Other researchers and students
   c) Relationships outside the ICRC
   d) Others?

4) Does the university provide any additional support for the ICRC, such as returned or indirect supporting faculty time?

5) Describe the relationship between the ICRC leadership/management and the research agenda for the ICRC.
   a) What is the role of ICRC management or leadership in setting injury outcomes?
   b) How are injury outcomes communicated to the ICRC staff and researchers?
   c) How does the ICRC use CDC's Injury Research Agenda, if at all?
   d) What is the influence of CDC on your ICRC's research agenda?

6) How does the ICRC prioritize its research agenda?
   a) Grant requirements?
   b) Leadership priorities?
   c) Gaps in the field?
   d) Available funding?

7) How does the ICRC balance different/multiple grant requirements and influences?
   a) In terms of prioritization of the research agenda
   b) In terms of grants, funding requests

8) How is the center placed within the structure of the host university?
   a) Administration/organization chart
   b) What is the benefit to the University of having an ICRC?
      i) Perceived benefits
      ii) Actual benefits

9) Describe the relationship with the dean and president of the school.

10) Are there certain requirements that the university places on you as research center? (For example, evaluation, reporting or management requirements)
   a) If so, please describe these requirements.
   b) How do these requirements affect your work?

11) What is the role of evaluation within your ICRC?
   a) Do you have a dedicated evaluator?
   b) If so, why?
   c) If so, how does having an evaluator on staff affect the ICRC?

12) Has the center received any awards or recognition from external sources, including the university in general? The awards can be for research, researchers or graduate students.

B. Resources and CDC Technical Assistance

1) Can you describe the general ways that CDC funds are used for research and core activities?

2) Talk to us about funding issues in the area of injury prevention research.

3) Are there training, technical assistance or other resources that CDC could provide to improve your ability to conduct injury prevention research?

4) What percent of funding for the ICRC comes from CDC funds? Where does the remaining funding come from?

5) How does being a CDC-funded ICRC affect your ability to leverage other funding (CDC, other federal funding, private funding, foundations, etc.)?
   a) Is CDC funding used as seed money to obtain other funding?
   b) Is CDC funding viewed as just another source of funding?
   c) Is there any strategic, planned use of CDC funds to leverage other funding?

C. Training

1) Describe your injury training program.
   a) within the center
   b) within the university
   c) with external researchers
   d) practitioners
   e) community members (non-injury related)
   f) global participants

2) Describe the ICRC graduate student training program.
   a) How is it perceived by graduate students?
   b) Is it promoted? If so, how?
   c) Is it evaluated? Is so, how?

3) Describe other ICRC training program(s).
   a) How is it perceived by researchers and other participants, especially those new to the field?
   b) Is it promoted? If so, how?
   c) Is it evaluated? Is so, how?

4) How does the ICRC program impact recruitment/enrollment?
   a) Students?
   b) Faculty?
   c) Researchers?

5) For students:
   a) What factors influenced your decision to study here?
      i) Deciding factors
      ii) Individual experiences
   b) What are your goals upon graduation?

D. Collaborations and Partnerships

1) Describe the nature of internal partnerships, within the ICRC.
   a) Mentoring?
   b) Training?
   c) Collaborations?

2) We're going to talk about partnerships. Thinking about these partnerships, do you have formal structures you use in creating these partnerships?
   a) Memorandum of Understanding
   b) Contracts
   c) Are there differences among the formal structures used to create partnerships? For example, are some more defined than others? If so, why?

3) Describe your collaborations or partnerships.
   a) Other groups/individuals within the university?
      i) Who do you interact with?
      ii) Do you provide technical assistance?
      iii) What is the role or purpose of these partnerships?
      iv) What do the partners bring to the table?
      v) How was this partnership created?
      vi) Are there formal structures you use to obtain input from this partner?

   b) Non-profits/advocacy groups?
      i) Who do you interact with?
      ii) Do you provide technical assistance?
      iii) Do you share research findings with advocates?
      iv) What is the role or purpose of these partnerships?
      v) What do the partners bring to the table?
      vi) How was this partnership created?
      vii) Are there formal structures in place to obtain input from this partner?

   c) Other ICRCs?
      i) Which ones?
      ii) Relationships with both CDC-funded ICRCs and non-CDC funded ICRCs?
      iii) Can you describe the relationship?
      iv) What is the role or purpose of these partnerships?
      v) What do the partners bring to the table?
      vi) How was this partnership created?
      vii) What are the differences (actual or perceived) between non-CDC funded ICRCs and CDC-funded ICRCs?
      viii) Are there formal structures in place to obtain input from this partner?

   d) Other CDC-funded programs?
      i) HIV/AIDS
      ii) Public Health Preparedness
      iii) Chronic Disease
      iv) Global Health
      v) Environmental Health
      vi) Others

e) Non-public health partners? (NHSTA, DOJ, Fire and Safety/EMS, Military, Community Groups)
   i) Who do you interact with?
   ii) Do you provide technical assistance?
   iii) What is the role or purpose of these partnerships?
   iv) What do the partners bring to the table?
   v) How was this partnership created?
   vi) Are there formal structures in place to obtain input from this partner?

4) Describe any international partnerships you have built.
   i) How do you share research or research findings internationally?
   ii) How do you establish or seek out new international relationships (for example, do you purposefully seek out international conferences with other researchers in attendance?)?
   iii) What is the role or purpose of these partnerships?
   iv) How was this partnership created?
   v) What do you see as the future priorities for global injury prevention research?
   vi) Are there formal structures in place to obtain input from this partner?

E. Benefit of the ICRC Beyond CDC and ICRCs

1) Who benefits from the ICRC?
   a) General public? How do they benefit?
   b) Local public health departments? How do they benefit?
   c) Schools? How do they benefit?
   d) Partners? How do they benefit?
   e) Other researchers? How do they benefit?
   f) Are there services provided to others?
      i) Volunteering in the community?
      ii) Others?

2) Does being affiliated with CDC affect your reputation? How?
   a) Benefits?
   b) Challenges?

3) Describe how your ICRC is building or contributing to the injury prevention and control field?
   a) Infrastructure (research, labs, tools)
   b) Training of researchers
   c) Others

F. Influence of ICRCs on Injury Outcomes

1) Can you describe any models that you have used as a framework to get to specific outcomes?
      i) Health Belief Model?
      ii) CDC Public Health Prevention Framework?
      iii) Socioecologic model and environmental change approaches?
   b) How did you identify these frameworks or approaches?
   c) Have there been any challenges in incorporating these approaches into the injury prevention and control field?

2) How does the center prioritize what injury outcomes to focus on?
   a) Funding requirements?
   b) Leadership direction?
   c) History of center?
   d) Research gaps?
   e) Available data?

3) What are the injury outcomes currently being focused on?

4) Did you start off with these as a focus or did they just naturally emerge?

5) Are you aware of any overarching injury outcomes that are a priority for this ICRC?
   a) If so, how do these outcomes affect your research?

6) How do you link what your current injury outcomes are to more broad, big-picture injury outcomes?

7) What injury disparities do the ICRCs focus on (or vulnerable populations), if any?
   a) If any have been identified, how were these injury disparities prioritized or identified?
      i) Population selection
      ii) Research and dissemination of research
      iii) Have the disparities foci evolved over time? And if so, how?

G. Contributions toward Behavior Modification

1) Describe any specific contributions to injury behavior modification made by researchers here.

2) How did these contributions evolve over time?
   a) Was there specific foundational or developmental research conducted first that led to specific behavior modifications?

3) Did the ICRCs (or individual researchers at ICRCs) start research with the *intent* to create a tool/approach/other tangible outcome to reduce injury?

4) Do researchers receive any guidance, direction or training from administration or seasoned researchers, regarding focusing their research on behavior change?
   a) If so, please describe.
   b) If not, how do the researchers know how to structure their research to produce this outcome?

H. Dissemination of Findings

1) How is ICRC research disseminated?
      i) Academic dissemination, peer reviewed journals, etc.
      ii) General publications, NPR, CNN, magazines, newspapers, etc.
      iii) Are there specific staff dedicated to dissemination? What is their experience?
      iv) Who else is involved in dissemination?
      v) Are there specific protocols for communication with the public/press?
         (1) Who, what, when, where, why and how?

2) Can you describe the value that is placed on dissemination within this ICRC?
   a) Is there an emphasis placed on dissemination or is it more on an as needed/as applicable basis?

3) Who is information disseminated to….
   a) Institutions? What kind of information? How?
   b) Academics? What kind of information? How?
   c) Non-profits? What kind of information? How?
   d) The community? What kind of information? How?
   e) Practitioners? What kind of information? How?
   f) Policymakers? What kind of information? How?
   g) Others?

4) How often is the ICRC approached to provide information?
   a) Who approaches?
   b) What are they approaching ICRC about?
   c) Why did they pick ICRC over someone else?
   d) Can you provide some examples?

I. Influences on policy and legislation

1) What does the ICRC see as its role in policy development?

2) Does the ICRC seek out or make active attempts to influence policy (organizational, state, federal)?
   a) How?
   b) If yes, why is this a focus?
   c) If no, why is this not a focus?
   d) How is this work prioritized?

3) What are the ICRC's connections to policymakers?
   a) Who knows who
   b) Do ICRC leaders have an understanding of the legislative process?
   c) Do ICRC leaders have connections to legislators, policymakers?

4) What *levels* of policies are implemented? (private or public organizations, local, state, or federal)?
   a) Is there any consideration of organizational policy changes, rather than state or federal policy changes, for example, at a school district level, neighborhood or workplace level?

5) Please describe any policy or legislation outcomes achieved by the ICRC.

J. Closing

1) What are the challenges associated with being a CDC-funded ICRC?

2) How would you like to see CDC use the information collected from these site visits?
   a) For this evaluation only?
   b) To improve ICRCs overall?
   c) Share it with other interested or potential partners?

3) Discuss the next steps/timeline (Sue Lin)

4) If we use any specific quotes or examples from this site visit in our final report we will ensure that you have a chance to review the information prior to the final report submission.

ICRC Portfolio Evaluation Questionnaire

Introduction

Good Morning/Afternoon. Thank you so much for participating in the ICRC Portfolio Evaluation Telephone Interview. My name is Dr. Kristi Pettibone and I am with The MayaTech Corporation. Also on the line from MayaTech is Jamie Weinstein, who will be taking notes during the interview.

We want to remind you that this evaluation is mandated under a CDC policy that requires the evaluation of research and scientific programs every five years. The goal of this evaluation is to assess the Injury Control Research Center program, not each of the individual centers. During this interview, we will be collecting information about 1) research priorities and activities; 2) funding; 3) factors that promote injury research; 4) center evaluation; and 5) future directions, among other things.

As we go through the questionnaire today, please feel free to stop me at any time if you have questions or additional information you would like to add. You may also submit written comments to us with any relevant information that you feel was left out from this interview. Those written comments must be submitted within one week from today.

Do you have any questions before we begin?

ICRC Portfolio Evaluation Questionnaire

Question	Timeframe
Research Activities	
1. What are the current top 3 research priorities for your Center?	Under ICRC's current FOA
1. Response (Please limit your response to approximately 1000 words.):	
1.1. How did you determine these priorities?	Historical
1.1 Response (Please limit your response to approximately 500 words.):	
1.2 How and why have these research priorities changed over the history of your Center?	Historical
1.2 Response (Please limit your response to approximately 500-800 words.):	
2. Describe up to 3 examples of how you have conducted research that has moved through the phases of the research spectrum (foundational, developmental, intervention evaluation and translational research). Priority should be on describing research that has moved through the entire spectrum. If that's not possible, provide examples of research that illustrates the most movement along the spectrum. We understand that some new research may not have had an opportunity to move through the research spectrum but has the potential to move through it.	Historical
2. Response (Please limit your response to approximately 1000 words total.):	
3. Please describe activities that you have conducted to build your ICRC's research infrastructure (i.e., administrative activities, building and maintaining a library, databases, labs, equipment, etc.).	Historical
3. Response (Please limit your response to approximately 1000 words.):	
4. Please describe 3 to 5 of the most important tools, curricula, protocols, guidelines, or interventions that your ICRC has developed and their contribution to the injury prevention and control field.	Historical
4. Response (Please limit your response to approximately 1000 words.):	
5. Please provide one example of how your ICRC has contributed to the development of new policy or has informed decision making among policy makers. Please consider in your response that policy can include local, state and federal policy, as well as private/organizational policy.	Historical
5. Response (Please limit your response to approximately 500 words.):	
6. How does your ICRC share information about the ICRC's research activities with the general public, practitioners, and the scientific community?	Under ICRC's current FOA
6. Response (Please limit your response to approximately 500 words.):	
Publications	
7. Please provide the total number of publications that your center has produced using the categories provided below.	Historical
7. Response (Please provide whole numbers below.): Journal articles (Total # published, # peer-reviewed) Chapters (Total # published, # peer-reviewed) Books (Total # published, # peer-reviewed) Technical Reports (Total # published, # peer-reviewed) Other (Total # published, # peer-reviewed)	
7.1 Please submit bibliographic information on 15 peer reviewed publications that	Historical

have resulted from CDC ICRC funded projects that you think have been the most influential on the injury prevention and control field. You can cite publications for which other sources of funding were used in conjunction with CDC ICRC funding.	
7.1 Response (Please email your bibliographic information to CDC-ICRC-Evaluation@mayatech.com at least 2 days prior to your scheduled interview. Please make sure to indicate if the publication is a journal article, chapter, book or technical report.)	
7.2 Of the 15 peer reviewed publications you submitted, please describe the 3 most influential. In your description, please describe the impact or influence of the publication, the organization or the people involved, the funding expended, and the length of time that it took for the ICRC to move the project through to completion, if it has been completed.	Historical
7.2 Response (Include, as appropriate, the names of authors, year of publication, title of the article or chapter, title of the journal or book, page numbers, and place of publication using the example given as a model for the citation format. Please limit your response to approximately 2100 words.): Sample: Sample, P.L., et al. (2004). Can traumatic brain injury surveillance systems be used to link individuals with TBI to services? Brain Injury, 18, 1177-1189.	
7.3) If someone from your ICRC was the primary author and/or editor of a book, please provide the title and author/editor, and describe why it was influential.	Historical
7.3) Response (Please limit your response to approximately 500 words.):	
Funding	
8. Please describe how CDC ICRC funding contributes to your Center's research infrastructure, (i.e., administrative activities, building and maintaining a library, databases, labs, equipment, etc.).	Historical
8. Response (Please limit your response to approximately 500 words.):	
9. Please describe how CDC ICRC funding contributes to your Center's ability to conduct service activities, (i.e., technical assistance, evaluation services, consultation, etc.). Reserve discussion on training for questions 13-17.	Under ICRC's current FOA
9. Response (Please limit your response to approximately 500 words.):	
10. List the names of non-CDC ICRC funding sources that help support your Center. You do not need to include dollar amounts.	Under ICRC's current FOA
10. Response (Please provide a succinct list.):	
10.1 Please describe how your Center uses CDC ICRC funds to leverage other resources, including monetary and non-monetary support.	Historical
10.1 Response (Please limit your response to approximately 500 words.):	

11. Please provide the total amount of Center funding for the last 3 calendar years. (This includes CDC ICRC funding, as well as ALL OTHER SOURCES OF FUNDING.)	1/1-12/31 2005 1/1-12/31 2006 1/1-12/31 2007
11. Response. (Please provide a total dollar amount for each of the last 3 calendar years.) Jan. 1 – Dec. 31, 2005: $_____ Jan. 1 – Dec. 31, 2006: $_____ Jan. 1 – Dec. 31, 2007: $_____	
Center Characteristics	
12. What are some factors or characteristics that promote or facilitate research within your Center? (Please leave this response for the phone interview.)	Historical
12. Leave this response for the phone interview.	
Training	
13. Please describe up to 3 innovative activities that have occurred over the course of your ICRC history that have contributed to the mentoring or training of students, practitioners, professionals, community members and others, in any setting.	Historical
13. Response (Please limit your response to approximately 1000 words.):	
14. Please tell us what systems are in place to track and monitor participation in the graduate student training program or other graduate student activities at your ICRC.	Under ICRC's current FOA
14. Response (Please limit your response to approximately 500 words.):	
14.1 Please provide an estimate of the total number of graduate students who graduated with an injury emphasis or concentration. You can specify by degree type if you have that information available.	Historical
14.1 Response (Please provide a number. You can specify by degree type if you have that information available.):	
15. Please describe how the number of trainings conducted per year may have increased or decreased over the course of your Center's history. Trainings can include courses, portions of courses, institutes, seminars, workshops, and any other ways that your Center has provided information or education to students, practitioners, professionals, community members and others, in any setting.	Historical
15. Response (Please limit your response to approximately 500 words.):	
16. Please describe how your ICRC's training activities or program may have changed over the history of your Center. These changes may include audiences, intensity/duration, topics, etc.	Historical
16. Response (Please limit your response to approximately 500 words.):	

Partnerships/Collaborations	
17. Please list up to 3 of your Center's most influential collaborations/partnerships. Be sure to indicate how long your Center worked (or did work) with this partner. These can be collaborations or partnerships related to research or non-research activities.	Historical
17. Response (Please limit your response to approximately 150 words per collaboration.): 1) 2) 3)	
17.1 Why are the collaborations that you described in question 17 influential?	Historical
17.1 Response (Please limit your response to approximately 500 words per collaboration. Also, please list them in the same order as you listed your responses in question 17.): 1) 2) 3)	
18. If your Center collaborates with other ICRCs (both CDC funded and non-CDC funded), please provide up to 3 examples of this collaboration. In your examples, indicate which ICRCs your Center collaborates with and describe these collaborations.	Historical
18. Response (Please limit your response to approximately 500 words per collaboration.): 1) 2) 3)	
19. Is there a collaborator or partner that your Center would like to work with more?	Under ICRC's current FOA
19. Response (Please limit your response to approximately 150 words.):	
19.1 What has prevented your Center from pursuing that relationship?	Under ICRC's current FOA
19.1 Response (Please limit your response to approximately 250 words.):	
19.2 What can CDC do to help foster that relationship?	Under ICRC's current FOA
19.2 Response (Please limit your response to approximately 250 words.):	
Other and Closing	
20. Since NCIPC considers the ICRCs an extension of CDC, please tell us how you think CDC benefits from the relationship with your ICRC. Please include specific examples in your response.	Historical
20. Response (Please limit your response to approximately 1000 words.):	
21. Describe evaluation or monitoring activities that your Center conducts to assess its performance. Examples might include tracking publications, monitoring work with communities, or evaluating research topics and training programs to ensure that these activities are yielding useful outcomes.	Under ICRC's current FOA
21. Response (Please limit your response to approximately 500 words.):	
21.1 How do these evaluation and monitoring activities provide your ICRC with the information needed to assess the Center's performance, relevance, and/or significance?	Under ICRC's current FOA
21.1 Response (Please limit your response to approximately 500 words.):	
22. What do you see as the evolving research priorities for your Center over the next	Next 5 to 10

5 to 10 years?	years
22. Response (Please limit your response to approximately 500 words.):	
23. Do you have suggestions for how to improve the ICRC program? These suggestions may include improvements led by CDC or the ICRCs.	Future
23. Response (Please limit your response to approximately 500 words.):	
24. Do you have anything else you'd like to tell us?	
24. Response (Please limit your response to approximately 500 words.):	

Closing

Thank you again for your participation in this interview. The information gleaned from these telephone interviews will enable us to demonstrate the excellent work of the injury prevention research community. Currently we are scheduled to complete all of the interviews with the ICRC Directors by December 18 [2008]. Starting in January [2009] we will begin analyzing the interviews and will also begin Phase III of the data collection, which involves interviews with CDC staff. We expect to have a final report submitted to CDC sometime in late fall 2009. The final report will be reviewed by a federally chartered peer review panel that will provide feedback and recommendations to the program.

ICRC Portfolio Evaluation Questions for CDC Staff

Background/Role of Staff Member with ICRCs
1. What is your educational and professional background?
2. Did you study, train or work at an ICRC institution at anytime in your career in Injury Prevention and Control?
3. What is/was your role with the ICRC program at CDC?
4. Please describe briefly the type of activities or projects that you conducted with the ICRC program. Successes? Challenges?
5. When were these activities conducted (year began, year ended)? What were the funding mechanisms for these projects?
6. Did your role with the ICRCs change over time? If so, please describe.
7. Describe how you interact with the ICRCs (email, listservs, conferences).
8. Of the ways you just described interacting with the ICRCs, which do you consider to be the most effective, and why?
9. Do (did) you ever collaborate on projects/research with the ICRCs, outside of the traditional funder/grantee relationship?
10. Please describe any challenge or successes associated with these projects?
ICRC Contributions to the Injury prevention and control field
11. What do you think CDC gains from the ICRC program?
12. How does NCIPC make use of the benefits that the ICRCs provide?
13. How do you think the ICRCs contribute to the field of injury prevention and control?
14. Is there any other program inside or outside of CDC that could provide these benefits other than the ICRCs?
15. Are there activities or research that would benefit CDC and the ICRCs that are not currently being conducted? If so, where/who might be able to conduct this research or activities? What might the barriers be to conducting those activities? What could CDC do to help facilitate those activities?
Program Management
16. Are there ways that CDC staff could work differently with the ICRCs? What are the challenges to implementing this type of change?
17. Are there activities that you would like to see done differently as related to the ICRC program, such as: How the program is managed, interactions between CDC and the ICRCs, or other areas that might benefit from a change?
18. In thinking about the ICRC program's accumulated activities, outputs, and products (i.e. taking into account your experience with the ICRCs), please describe how well you think the ICRCs are in building the Injury Prevention and Control field.
19. What factors do you think enable the ICRCs to build the injury prevention and control field?

Appendix E: ICRC Profiles

University of Alabama at Birmingham Injury Control Research Center
Center Director: Russ Fine, PhD, MSPH
Associated Institution: University of Alabama at Birmingham
Location: Birmingham, AL
Contact Information:
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The UAB Injury Control Research Center's (UAB-ICRC's) mission is to help the nation significantly reduce injury-related morbidity, mortality, and disability, particularly in the Southeast. The Center's overarching objective is to help increase the injury control capacity of UAB and collaborating entities at the local, state, regional, and national levels. This objective is achieved through rigorous research, community-based practice, comprehensive training, and innovative public service initiatives.

The Center's specific aims and objectives include:

1. improving practices and processes that will help injured persons achieve their maximum potential,

2. stimulating faculty development in rehabilitation, primary prevention, acute care, biomechanics, and epidemiology through research, training, and public service projects,

3. training health care workers and other practitioners, scientists, and students in the discipline of injury control,

4. providing technical assistance and disseminating information to support the nation's injury control agenda, and

5. promoting explicit injury control initiatives that target high-risk populations.

All of the Center's research activities fit into one of three core areas: rehabilitation, acute care, and prevention. Within these cores, activities fall within one of two research domains: behavioral interventions for injury control or environmental interventions for injury control.

University of California, San Francisco Injury Center
Principal Investigator: Rochelle Dicker, MD
Associated Institution: University of California- San Francisco
Project Location: San Francisco, CA
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The San Francisco Injury Center (SFIC) has as its theme, "Injury Control 2010: Making Changes and Meeting Challenges." The Center's work builds on its history of successfully conducting high quality scientific research that impacts the care of the severely injured patient, while at the same time focusing on prevention programs driven by local data. The Core activities include the following:

1) development and dissemination of an interactive, computer-based prevention game for elementary school children;

2) development of a burn prevention program in an underdeveloped country; and

3) continuing a commitment to the education and training of future injury control professionals through work with doctors in training, research fellows, local community groups, and practicing physicians in the U.S. and abroad.

The Center's small research projects aim: 1) to explore screening and intervention for psychiatric disorders in acutely injured patients as a means of injury prevention; and 2) to develop a new paradigm for a trauma system's approach to the care of interpersonal violent injury victims in order to minimize risk of future injury. The specific aims of the major research projects include to: 1) critically evaluate the cost effectiveness of traffic interventions aimed at reducing pedestrian injuries; 2) investigate the use of two novel methods of monitoring resuscitation in critically injured patients; and 3) develop and validate a scenario-based, simulation-enhanced curriculum designed to prepare surgeons to deal with injuries common to military and civilian mass casualty incidents.

Colorado Injury Control Research Center
Center Director: Lorann Stallones, MPH, PhD
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Project Location: Fort Collins, CO
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The purpose of the Colorado Injury Control Research Center (CICRC) is to reduce the occurrence, severity, and adverse consequences of injuries through research, education, and service. Emphasis is placed on reducing disparities in injury outcomes through focusing on community partnerships among underserved populations, such as Native Americans, Hispanics and rural residents. Core values that govern the activities at the CICRC are the following: a primary focus on reducing disparities in the prevention and control of injuries; seeking collaborative relationships with communities; innovation in education/training, community programs and research; and identification of evidence-based, efficient approaches to prevent of injuries.

The specific aims of the CICRC are to:

- Promote training and education related to injuries and control of injuries
- Expand existing community based activities in injury prevention and control
- Utilize existing data to identify injury pattern
- Increase and diversify funding sources for injury research, community-based programs, education and training
- Disseminate information about injury prevention and control
- Promote the development of new investigators in injury prevention and control research
- Conduct high quality, innovative research in acute care, prevention/control, and rehabilitation of injuries

Harborview Injury Prevention and Research Center
Center Director: Beth Ebel, MD, MSc, MPH
Associated Institution: University of Washington/Harborview Medical Center
Project Location: Seattle, WA
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The Harborview Injury Prevention and Research Center (HIPRC) is a multidisciplinary effort which, through its research, education, and prevention programs, seeks to diminish the impact of trauma on people's lives and to broaden the effectiveness of the Northwest region's injury prevention and treatment programs. This Center develops, applies, and evaluates current and new interventions and strategies to decrease morbidity and mortality from trauma. This is accomplished by efforts within the four defined phases of injury control:

1. Prevention
2. Acute care
3. Rehabilitation
4. Biomechanics

The Center applies state-of-the-art tools of epidemiology to define risk factors and evaluate interventions; develops and evaluates new injury prevention programs and disseminates them nationally and internationally; evaluates traditional and new approaches to the treatment of acutely injured patients and disabled victims of trauma; develops methods to prevent secondary disabilities among trauma victims; uses biomechanics to determine the physical cause of injury; trains investigators in the field of injury research; and works with public and private organizations to provide technical assistance and consultation to enhance the mutual efforts to control injuries.

Harvard Injury Control Research Center
Center Director: David Hemenway, PhD
Associated Institution: Harvard University: School of Public Health
Project Location: Boston, MA
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The Harvard Injury Control Research Center (HICRC) is a multidisciplinary center aimed at "protecting vulnerable populations." This is accomplished through applied research projects, training students and practitioners, and communications. The Center's administration and research team demonstrate a long-standing commitment to the field of injury control while welcoming an influx of fresh ideas, personnel, and foci. The Center offers outstanding opportunities for training through its commitment to student research opportunities. Its mentorship program matches experienced researchers with students, provides postdoctoral fellowships, and promotes other research opportunities with local or state agencies.

HICRC devotes significant resources to teaching and training**.** The injury prevention and control field is in its adolescence; thus, one goal of HICRC is to expand and promote the field within and outside the academic environment. HICRC emphasizes:

- Providing high-quality training to students and practitioners
- Attracting new and experienced scholars to the injury prevention and control field
- Increasing the interest and knowledge of policy makers and the media

HICRC collaborates with scientists and injury control professionals at the local, national, and international level. To assure the Center's growth and continued development, an independent advisory committee meets annually to evaluate progress and suggest new projects and direction.

The HICRC research resources are devoted to three priority issues: occupational injuries, traffic safety, and violence prevention, including a national effort to create a nationwide firearms injury surveillance system that will provide accurate, timely, comparable, and comprehensive data on gun-related injuries.

University of Iowa Injury Prevention Research Center
Center Director: Corinne Peek-Asa, PhD
Associated Institution: The University of Iowa
Project Location: Iowa City, IA
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The University of Iowa Injury Prevention Research Center (IPRC) aims to use interdisciplinary research to control and prevent injuries, especially in rural communities. The center is organized into a Management Team that oversees daily operations, an Executive Committee that implements our vision for the center, three Cores, six Expert Research Teams, and five research projects. The Research Support Core, Training Core, and Administrative and Outreach Core provide services to IPRC partners, including a very successful pilot grant program that is funded through institutional support. The six Expert Teams are organized around the Center's priority research topics:

- Simulation and Human Factors
- Interpersonal Violence
- Behavioral Sciences and Evaluation
- Acute Care
- Rural Injuries
- International Research

Teams promote the growth of research within their topic areas by linking researchers to IPRC Core services, mentoring students and junior faculty, and engaging with community partners.

The Center's research projects address a wide variety of injury topics; include Principal Investigators from Community and Behavioral Health, Engineering, Social Work, Epidemiology, and Psychology; and involve partners such as the Department of Corrections, local schools, and health care clinics. The Center's activities constitute a broad, multidisciplinary, and collaborative program in research, training, and outreach.

Johns Hopkins Center for Injury Research and Policy
Center Director: Andrea Carson Gielen, ScD, ScM
Associated Institution: The Johns Hopkins University School of Public Health
Location: Baltimore, MD
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The Johns Hopkins Center for Injury Research and Policy (CIRP) is a scientifically-based academic organization that addresses all phases of injury control within its theme of "Science Informing Program and Policy" in injury control. The Center integrates the disciplines of epidemiology, biostatistics, medicine, law, health policy, health services research, criminal justice, and behavioral sciences to address the prevention, acute care, and rehabilitation of injuries. Conducting high quality research that informs the establishment of programs and policy is a priority for the Center.

The Center's core activities are organized around a set of specific objectives for research, education, and professional practice and service. Research objectives focus on

- enhancing databases
- studying epidemiology and outcomes
- developing methods for program and policy evaluation
- developing and evaluating interventions, and
- identifying factors that influence implementation.

Educational objectives focus on

- enhancing our formal training programs,
- developing or enhancing continuing education for injury practitioners,
- educating the public, and
- educating decision makers about the injury problem and solutions.

Finally, the professional practice and service objectives include providing technical assistance to public and private agencies partnering with community groups and local or state agencies to comprehensively and effectively control injuries, and providing service and leadership to the field of injury control.

The Mount Sinai Injury Control Research Center*
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The Mount Sinai Injury Control Research Center (ICRC) was initiated within the Department of Rehabilitation Medicine, Mount Sinai School of Medicine (MSSM), New York City, drawing in relevant expertise from and participation of other disciplines within MSSM (emergency medicine, community medicine), as well as from other institutions (Columbia University College of Physicians and Surgeons, JFK Rehabilitation Institute of the University of Medicine and Dentistry of New Jersey and The National Rehabilitation Hospital).

The major theme of the ICRC is enhancing quality of life of individuals who have experienced TBI. The sole focus is on secondary and tertiary prevention, that is, on minimizing the effects of injury once a person has experienced a TBI.

The research program is aimed at developing: (1) better rehabilitation interventions, (2) an approach to better identify those individuals with "hidden" TBI, and (3) a method to identify the long-term needs of individuals with TBI. Additionally, funds will be made available to support seed projects, as a means of bolstering the injury control structure of researchers within New York and the surrounding region.

*The Mount Sinai Injury Control Research Center was not a participant in the 2008-2009 ICRC Portfolio Evaluation.

Center for Injury Research and Policy*
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The theme of the Center for Injury Research and Policy is the prevention and control of fatal and nonfatal injury and related disability among children and adolescents. Injury is the most compelling public health problem among our nation's youth. Research leading to a better scientific understanding of the epidemiology, prevention, acute treatment, rehabilitation, and biomechanics of injuries among children and adolescents clearly deserve special focus and attention. Children have unique anatomical, physiologic, psychological, and other developmental characteristics and needs that make them different from adults. Drawing upon the outstanding pediatric experience and expertise of its research faculty, the center will employ a multifaceted and multi-disciplinary approach to achieve its aims:

1. To improve the scientific understanding of the epidemiology, prevention, acute treatment, rehabilitation, and biomechanics of injuries to children and adolescents.

2. To develop and conduct preliminary scientific studies (seed research projects) that will inform and guide future injury-related research.

3. To conduct education training to promote the field of injury prevention and control.

4. To provide leadership in advocacy and technical assistance for prevention and control of injuries to children and adolescents.

5. To promote professional development of center faculty and staff to help them become more successful as leaders in the field of injury prevention and control.

6. To conduct ongoing monitoring, evaluation, and improvement of center organizational structure and procedures to promote excellence.

*The Center for Injury Research and Policy was not a participant in the 2008-2009 ICRC Portfolio Evaluation.

University of North Carolina Injury Prevention Research Center
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The University of North Carolina Injury Prevention Research Center (UNC IPRC) has a history of building the injury prevention and control field through research, collaboration, teaching, and publication. The Center is making a difference by translating research into practice. The Center's mission is to build the field of injury prevention and control through a combination of interdisciplinary scholarly approaches to research, intervention, and evaluation as well as through the training of the next generation of researchers and practitioners.

Organizationally, UNC IPRC operates as a freestanding Center within the UNC Division of Health Affairs, with strong linkages to other campuses in the UNC system. External advisors provide periodic guidance while an interdisciplinary Senior Advisory Committee offers on-going, high-level support and assistance on campus. Core faculty and staff meet regularly to develop programs and monitor progress and continuously improve program quality. Center faculty members, principal investigators, project directors, staff and students come from more than a dozen academic units on the Chapel Hill campus and from several other UNC campuses.

Research activities revolve around occupational injury, violence, and sports and recreational injury. Other activities focus on research stimulation, including statistical assistance, faculty small grants, and work with faculty to use secondary data sets for research, such as medical examiner data. The Center also teaches graduate students, and provides technical assistance and consultation on translating research into practice.

University of Pittsburgh Center for Injury Research and Control
Center Director: Anthony Fabio, PhD, MPH
Associated Institution: University of Pittsburgh
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The University of Pittsburgh Center for Injury Research and Control (CIRCL) is a comprehensive, broad-based program that provides for injury-related prevention, acute care, and rehabilitation services through its extensive collaboration with four schools and twelve departments within the University. The unifying theme of the Center is "Head and Spinal Cord Injuries: Prevention, Acute Care and Rehabilitation." The Center is committed to intervention-oriented applied research and the maintenance of collaborative projects with community organizations that can facilitate the application of research findings to the general public.

The long-term goal of the Center is to reduce the incidence of traumatic brain injury (TBI) and spinal cord injury (SCI) through effective prevention programs, reduce the disability caused by these injuries through effective acute care programs, and improve the quality of survival for these individuals through rehabilitation programs. To accomplish these goals, the Center is organized into four cores.

The Injury Prevention Core collaborates with other community hospitals in providing comprehensive head injury and SCI prevention programs to local schools (THINKFIRST Program). The Acute Care Core evaluates the efficacy of pharmacologic intervention for central nervous system (CNS) stimulation following TBI and investigates the potential mechanisms of action of those drugs. The Rehabilitation/Engineering Core investigates wheelchair biomechanics and design, and through this work will attempt to reduce the incidence of injuries and discomfort suffered by individuals with SCI. The Service Core disseminates of findings to other injury control centers, researchers interested in head injury and SCI, and the public through extensive Website and Internet projects. The "Capture/Recapture" injury surveillance methodology, originally developed by Center investigators, will be used to provide an accurate assessment of the incidence of head injury and SCI in the region.

Southern California Injury Prevention Research Center
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The mission of the Southern California Injury Prevention Research Center (SCIPRC) is to develop and support a multidisciplinary academic and community effort with the goal of discovering and understanding patterns of injury occurrence in high-risk populations and controlling the incidence and consequences of these injuries.

Five specific aims are:

- Research
- Training
- Information dissemination
- Community activity
- Evaluation

The research activities include core projects and smaller seed projects that address acute care, prevention, and rehabilitation. The strength of this research program lies in its breadth and the available expertise in epidemiology, public health, clinical sciences, biomechanics, and behavioral and social sciences. The diversity of the core and seed projects expands the SCIPRC's ability to identify, understand, and explain injury occurrence and to implement and evaluate programs addressing current injury problem areas locally, nationally, and internationally. The SCIPRC also aims to strengthen its work in graduate-level training and professional education in injury control practice and methodology; and participates in community activities by conducting information-sharing seminars with collaborating community agencies, by serving on committees that shape the future of injury control in the area, and by providing technical assistance.

West Virginia University Injury Control Research Center
Past Director: James C. Helmkamp, PhD [Left position during evaluation]
Current Director: Jeffrey H. Coben, MD
Associated Institution: West Virginia University
Project Location: Morgantown, WV
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The mission of the West Virginia University Injury Control Research Center (WVU ICRC) is to advance the science and practice of injury control through research, education and information dissemination. This will be achieved through an interdisciplinary program combining evidence-based research, education, and training with consultation, collaboration, and technical assistance.

Specific aims of the WVU ICRC are to:

1) Conduct and stimulate interdisciplinary injury control research, with emphasis on injuries affecting high-risk rural populations;

(2) Promote scholarship and leadership in injury control by educating the next generation of West Virginia University graduate students and medical students in the science and practice of injury control;

(3) Provide accurate and timely information on the health and economic burden imposed by injuries and the effectiveness of preventive interventions through a range of dissemination activities; and

(4) Maintain an organizational structure that supports our mission and enhances Center growth, quality and efficiency through an evaluation and review process.

Injury Research Center at the Medical College of Wisconsin
Center Director: Stephen W. Hargarten, MD, MPH
Associated Institution: Medical College of Wisconsin
Project Location: Milwaukee, WI
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The Injury Research Center at the Medical College of Wisconsin (IRC) was established to address the burden of unintentional injury and violence in Region V, the Great Lakes region of the Midwest. Through its faculty, core activities, and research projects, the IRC integrates all phases of injury control to support its mission of reducing the burden and disparity of injury across the lifespan.

The aims of the Center are to:

- Incubate, identify, and conduct multi-disciplinary research on the prevention, acute care, and rehabilitation of injuries;
- Develop, implement, and evaluate multi-disciplinary education and training in clinical, research and public health aspects of injury prevention and control;
- Foster and disseminate policy-relevant injury research to inform policymaking at the local, state, and national level; and
- Provide leadership and direction to support the Injury Research Center's research, education, policy, and community prevention activities.

The IRC includes four core programs to support its mission: a Research Development and Support Core, an Education and Training Core, a Policy Core, and an Administrative Core. The IRC has established specific Cores with lead responsibility for each aim, and there is integration between the cores so that each core's activities complements, informs, and builds on the work of the other cores.

Appendix F: ICRC Publications

These publications are the publications submitted by the ICRCs as their 15 most influential publications. These publications were used to conduct the bibliometric analyses.

Colorado State University

1. Abbot JM. Johnson R, Koziol-McLain J, Lowenstein SR. Domestic violence against women: Incidence and prevalence in an emergency department population. JAMA: Journal of the American Medical Association.1995;273(22):1763-7.

2. Cigularov K, Chen PY, Thurber BW, Stallones L. Investigation of the effectiveness of a school-based suicide education program using three methodological approaches. Psychological Service. 2008;5(3):262-74.

3. Cooper S, Lezotte D, Jacobellis J, DiGuiseppi C. Does availability of mental health resources prevent recurrent suicidal behavior? An ecological analysis. Suicide and Life-Threatening Behavior. 2006;36(4):409-17.

4. Crume TL, DiGuiseppi C, Byers T, Sirotnak AP, Garrett CJ, Underascertainment of child maltreatment fatalities by death certificates, 1990-1998. Pediatrics. 2002;110(2):e18.

5. Deffenbacher JL, Huff M. E, Lynch RS, Oetting ER, Salvatore NF. Characteristics and treatment of high anger drivers. Journal of Counseling Psychology. 2000;47:5-17.

6. Gabella B, Hoffman RE, Marine W, Stallones L. Urban and rural traumatic brain injuries in Colorado. Annals of Epidemiology. 1997;7:207-2.

7. Gonzales MM., Dickinson LM, DiGuiseppi C, Lowenstein SR. Student drivers: A study of fatal motor vehicle crashes involving 16-year-old drivers. Annals of Emergency Medicine. 2005;45(2):140-6.

8. Goss CW, Van Bramer LD, Gliner JA, Porter TR, Roberts IG, DiGuiseppi C. Increased police patrols for preventing alcohol-impaired driving. Cochrane Database of Systematic Reviews 2005. 2008; Issue 2 . Art. No.: CD005242. DOI:10.1002/14651858.CD005242 .

9. Kakefuda I, Stallones L, Gibbs J. Readiness for Community-based Bicycle Helmet Use Programs. Journal of Health Psychology. 2008;13(5):639-43.

10. Kakefuda I, Yamanaka T, Stallones L, Motomura Y, Nishida Y. Child restraint seat use behavior and attitude among Japanese mothers. Accident Analysis and Prevention. 2008; 40:1234-43.

11. Porter TR, Crane LA, Dickinson LM, Gannon J, Drisko J, DiGuiseppi C. Parent opinions about the appropriate ages at which adult supervision is unnecessary for bathing, street crossing, and bicycling. Archives of Pediatrics & Adolescent Medicine. 2007;161(7):56-62.

12. Sample PL, Johns N, Gabella B, Langlois J. Can traumatic brain injury surveillance systems be used to link individuals with TBI to services? Brain Injury. 2004;18(12):1177-89.

13. Sample PL, Langlois JA. Linking people with traumatic brain injury to services: Successes and challenges in Colorado. Journal of Head Trauma Rehabilitation. 2005;20(3):270-8.
14. Stallones L, Beseler C. Pesticide poisoning and depressive symptoms among farm residents. Annals of Epidemiology. 2002;12:389-94.
15. Xiang H, Stallones L, Chen G Hostetler SG, Kelleher K. Nonfatal injuries among US children with disabling conditions. American Journal of Public Health. 2005;95(11):1970-5.

Harborview/University of Washington

1. Bulger EM, Jurkovich GJ, Nathens AB, Copass MK, Hanson S, Cooper C, Liu PY, Neff M, Awan AB, Warner K, Maier RV. Hypertonic resuscitation of hypovolemic shock after blunt trauma: A randomized controlled trial. Arch Surg. 2008 Feb;143(2):139,48; discussion 149.

2. Comtois KA, Schiff MA, Grossman DC. Psychiatric risk factors associated with postpartum suicide attempt in Washington State, 1992-2001. Am J Obstet Gynecol. 2008 Mar 19.

3. Cummings P, Rivara FP. Car occupant death according to the restraint use of other occupants: a matched cohort study. JAMA. 2004;291(3):343-9.

4. Ebel BE, Koepsell TD, Bennett EE, Rivara FP. Use of child booster seats in motor vehicles following a community campaign; a controlled trial. JAMA 2003;289:879-84.

5. Gentilello LM, Ebel BE, Wickizer TM, Salkever DS, Rivara FP. Alcohol interventions for trauma patients treated in emergency departments and hospitals: a cost benefit analysis. Ann Surg. 2005;241(4):541-550.

6. Grossman DC, Mueller BA, Riedy C, Dowd MD, Villaveces A, Prodzinski J, Nakagawara J, Howard J, Thiersch N, Harruff R. Gun storage practices and risk of youth suicide and unintentional firearm injuries. JAMA. 2005;293(6):707-714.

7. Holt VL, Kernic MA, Wolf ME, Rivara FP. Do protection orders affect the likelihood of future partner violence and injury? Am J Prev Med. 2003;24:16-21.

8. MacKenzie EJ, Rivara FP, Jurkovich GJ, Nathens AB, Frey KP, Egleston BL, Salkever DS, Scharfstein DO. A national evaluation of the effect of trauma-center care on mortality. N Engl J Med. 2006;354(4):366-78.

9. Mock C, Nguyen S, Quansah R, Arreola-Risa C, Viradia R, Joshipura M. Evaluation of Trauma Care capabilities in four countries using the WHO-IATSIC Guidelines for Essential Trauma Care. World J Surg. 2006;30:946-56.

10. Mueller BA, Sidman EA, Alter H, Perkins R, Grossman DC. Randomized controlled trial of ionization and photoelectric smoke alarm functionality. Inj Prev. 2008 Apr;14(2):80-6.

11. Rivara FP, Anderson ML, Fishman P, Bonomi AE, Reid RJ, Carrell D, Thompson RS. Healthcare utilization and costs for women with a history of intimate partner violence. Am J Prev Med 2007;32:89-96.

12. Rivara FP, Relyea-Chew A, Wang J, Riley S, Boisvert D, Gomez T. Drinking behaviors in young adults: the potential role of designated driver and safe ride home programs. Inj Prev. 2007;13(3):168-72.

13. Shumway-Cook A, Silver IF, Lemier M, York S, Cummings P, Koepsell TD. Effectiveness of a community-based multifactorial intervention on falls and fall risk factors in community-living older adults: a randomized, controlled trial. J Gerontol A Biol Sci Med Sci. 2007 Dec;62(12):1420-7.

14. Thompson DC, Nunn ME, Thompson RS, Rivara FP. Effectiveness of bicycle safety helmets in preventing serious facial injury. JAMA. 1996;276:1974-5.

15. Zatzick D, Jurkovich G, Fan MY, Grossman D, Russo J, Katon W, Rivara FP. The association between posttraumatic stress and depressive symptoms, and functional outcomes in adolescents followed longitudinally after injury hospitalization. Arch Pediatr Adolesc Med. In press.

Johns Hopkins University

1. Baker SP, Grabowski JG, Dodd RS, Shanahan DF, Lamb MW, Li G. EMS helicopter crashes: What influences fatal outcome? Ann Emerg Med. 2006;47:351-6.

2. Chen LH, Baker SP, Li G. Graduated driver licensing programs and fatal crashes of 16-year-old drivers: A national evaluation. Pediatrics. 2006; 118:56-62.

3. Chen LH, Baker SP, Braver ER, Li G. Carrying passengers as a risk factor for crashes fatal to 16 and 17 year old drivers. JAMA. 2000;283(12):1578-82.

4. Gielen AC, McDonald EM, Wilson MEH, Hwang WT, Serwint JR, Andrews JS, Wang MC. The Effects of Improved Access to Safety Counseling, Products and Home Visits on Parents' Safety Practices, Archives of Pediatrics and Adolescent Medicine. 2002;56:33-40.

5. Gielen AC, Sleet D. Application of behavior change theories and methods to injury prevention. Epidemiological Reviews. 2003;25:65-76

6. Gielen AC, McKenzie LB, McDonald EM, Shields WC, Wang MC, Cheng YJ, Weaver NL, Walker AR. Using a computer kiosk to promote child safety: results of a randomized, controlled trial in an urban pediatric emergency department. Pediatrics, 2007;120(2):330-9.

7. Langlois JA, Wallen BAR, Teret SP, et al. The impact of specific toy warning labels. JAMA. 1991;265(21):2848-2850.

8. Li G, Baker SP, Grabowski JGG, Qiang Y, McCarthy ML, Rebok GW, Age, flight experience, and risk of crash involvement in a cohort of professional pilots. Am J Epidemiology. 2003;57(10)874-880.

9. MacKenzie EJ, Bosse MJ, Pollak AN et al. Disability persists long-term following severe lower limb trauma: results of a seven year follow-up. Journal of Bone and Joint Surgery 2005;87(8):1801-9.

10. MacKenzie EJ, Rivara FP, Jurkovich GJ, Nathens AB, Frey KP, Egleston BL, Salkever DS, Scharfstein DO. A national evaluation of the effect of trauma- center care on mortality. New England Journal of Medicine. 2006;354(4):366-78.

11. Pollack KM, Sorock GS, Slade MD, Cantley L, Sircar K, Taiwo O, Cullen MR. Association between body mass index and acute traumatic workplace injury in hourly manufacturing employees. American Journal of Epidemiology. 2007;166(2):204-11.

12. Vernick JS. Lobbying and advocacy for the public's health: what are the limits for non-profit organizations. Am J Public Health. 1999;89:1425-9

13. Vernick JS, Li G, Ogaitis S, MacKenzie EJ, Baker SP, Gielen AC. Effects of high school driver education on motor vehicle crashes, violations and licensing. Am J Prev Med. 1999;16(1S):40-6.

14. Vernick JS, Sapsin JW, Teret SP, Mair JS. How litigation can promote product safety. Journal of Law, Medicine & Ethics.2004;551-5.

15. Webster DW, Vernick JS, Zeoli AM, Manganello JA. Association between youth-focused firearm laws and youth suicides. JAMA. 2004;Aug 4;292(5):594-601. Erratum in: JAMA. 2004 Sep 8;292(10):1178.

Medical College of Wisconsin

1. Allen S, Zhu S, Sauter C, Layde P, Hargarten, S. A comprehensive statewide analysis of seatbelt non-use with injury and hospital admissions: New data, old problem. Acad Emerg Med. 2006;13:427-34.

2. Ambuel B, Phelan MB, Hamberger LK, Wolff. Healthcare can change from within: a sustainable model for intimate partner violence intervention and prevention. In: Banyard V, Edwards V, Kendall-Tackett K, editors. Trauma and physical health: Integrating trauma practice into primary care. Binghampton, NY: The Haworth Press; 2005.

3. Dempsey RL**,** Layde PM, Laud PW, Guse CE, Hargarten SW. Incidence of sports and recreation related injuries resulting in hospitalization in Wisconsin in 2000. Injury Prevention. 2005;11(2):91-6.

4. Glysch RL, Hale LJ, Nie C, Hargarten SW. Wisconsin's violent death reporting system: Monitoring and responding to Wisconsin's violent deaths. WMJ. 2005;104(1):17-9.

5. Guse C, Cortés L, Hargarten S, Hennes H. Fatal injuries of US citizens abroad. J Trav Med. 2007;14(5):279–87.

6. Hamberger LK. Preparing the next generation of physicians: Medical school and residency-based intimate partner violence curriculum and evaluation. Trauma, Violence, and Abuse. 2007;(8):214-225.

7. Kiely JM, Brasel KJ, Weidner KL, Guse CE, Weigelt JA. Predicting Quality of Life Six Months After Traumatic Injury. J Trauma 2006;61:791-8.

8. Layde PM, Cortes LA, Teret SP, Brasel KJ, Kuhn EM, Mercy JA, Hargarten SW. Patient safety efforts should focus on medical injuries. JAMA. 2002;287(15):1993-7.

9. Layde PM, Meurer LN, Guse CE, Yang H, Laud P, Meurer JR, et al. Confidential performance feedback and organizational capacity building to improve hospital patient safety: results of a randomized trial. In: Henriksen K, Battles JB, Keyes MA, Grady ML, editors. Advances in patient safety: New directions and alternative approaches. Vol. 2. Culture and Redesign. AHRQ Publication No. 08-0034-2. Rockville, MD: Agency for Healthcare Research and Quality; August 2008. p. 1-12.

10. Meisel ZF, Hargarten S, Vernick J. Addressing prehospital patient safety using the science of injury prevention and control. Prehospital Emergency Care. 2008;12(4):411-6.

11. Nirula R, Pintar FA. Identification of vehicle components associated with severe thoracic injury in motor vehicle crashes: A CIREN and NASS analysis. *Accid Anal Prev*. 2008 Jan; 40(1):137-41. Epub. 2007;Jun 4.

12. Phelan MB, Falimirski ME, Simpson DE, Czinner ML, Hargarten SW. Competency-based Strategies for Injury Control and Prevention Curricula in Undergraduate Medical Education. Injury Prevention. 2007;13(1):6-9.

13. Sumner S, Layde, P, Guse, C. Firearm death rates and association with level of firearm purchase background check. American Journal of Preventive Medicine. 2008;35(1):1-6.

14. Winthrop AL, Brasel KJ, Stahovic L, Paulson J, Schneeberger B, Kuhn EM. Quality of Life and Functional Outcome after Pediatric Trauma. J Trauma 2005;58(3):468-74.

15. Zhu S, Layde P, Guse C, Laud P, Pintar F, Nirula R, Hargarten S. Obesity and Risk for Death due to Motor Vehicle Crashes. American Journal of Public Health, April 2006;94(4):734-9.

University of California, Los Angeles

1. Garcia L, Hurwitz EL, Kraus JF. Acculturation and intimate partner violence among latinas in Los Angeles. J Interpers Violence. 2004;20:569-590.

2. Hijar M, Carrillo C, Flores M, Anaya R, Lopez V. Risk factors in highway traffic accidents: a case control study. Accid Anal Prev. 2000;32:703-9.

3. Jenkins, L, Webb, T, Browne, N, Afifi A, Kraus J. An evaluation of the Motion Picture Association of America's treatment of violence in PG-, PG-13-, and R- rated films. Pediatrics. 2005;115: 512-7.

4. Kraus J, Anderson C, Hemyari P. Features of fatal- and severe-injury motorcycle crashes according to vehicle design type, California, 1985. J Traffic Med. 1992;20:5-13.

5. Kraus JF., Peek C, McArthur D, Williams A. The effect of the 1992 California motorcycle helmet use law on motorcycle crash fatalities and injuries. JAMA. 1994;272:1506-11.

6. Kraus J, Brown KA, McArthur DL, Peek-Asa C, Samaniego L, Kraus C, Zhou L. Reduction of acute low back injury by use of back supports. Int'l J Occup & Environ Health 1996;2:264-73.

7. Kraus. JF, Schaffer K, Rice T, Maroosis J, Harper J: A field trial of back belts to reduce the incidence of acute low back injuries in New York City home attendants. Int J_Occup Enviro Health. 2002;8:97-104.

8. Kraus JF, Schaffer K, Ayers K, Stenehjem J, Shen H, Afifi A. Physical complaints, medical service use, and social and employment changes following mild traumatic brain injury: A 6-month longitudinal study. Journal of Head Trauma Rehabilitation. 2005;20: 239-56.

9. Peek-Asa C, Kraus J, Bourque L, Vimalachandra D, Yu J, Abrams J. Fatal and hospitalized injuries resulting from the 1994 Northridge earthquake. Int J Epid. 1998;27:459-65.

10. Peek-Asa C, McArthur D, Kraus J. The prevalence of non-standard helmet use and head injuries among motorcycle riders. Accid Anal Prev.1999;31:229-33.

11. Peek-Asa C, Casteel C, Kraus JF, Whitten P. Employee and customer injury from violent crimes in small retail and service businesses. Am J Pub Hlth. 2006;96:1867-72.

12. Rice T, Peek-Asa C, Kraus JF. Effects of the California graduated driver licensing program. J Safety Res. 2004;35:375-81.

13. Servadei F, Begliomini C, Gardini E, Giustini M, Taggi F, Kraus J. The effect of Italy's motorcycle helmet law on traumatic brain injuries. Inj Prev. 2003;9:257-260

14. Webb T, Jenkins L, Afifi A, Browne N, Kraus J. Violent entertainment: an analysis of PG-13 films. Pediatrics 2007;119: e1219-e1229.

University of California, San Francisco

1. Branas CC, Knudson MM. Helmet Laws & Motorcycle Rider Deaths. Accid Anal Prev. 2001;33:641-8.

2. Brohi K, Cohen MJ, Ganter MT, Matthay MA, Mackersie RC, Pittet JF. Acute traumatic coagulopathy: initiated by hypoperfusion: modulated through the protein C pathway*?* Ann Surg. 2007;245(5);812-8.

3. Chi J, Knudson MM, Vassar M, McCarthy M, et al. Prehospital hypoxia predicts outcome in patients with traumatic brain injury: a prospective multicenter study. J Trauma. 2006;61(11):1134-41

4. Dicker RA, Jaeger S, Knudson MM, Mackersie RC, Morabito DJ, Antezana J, Texada M. Where do we go from here? Interim analysis to forge ahead in violence prevention [abstract]. J Trauma. 2008;64(1):248.

5. Ikossi DG, Lazar AA, Morabito D, Fildes J, Knudson MM. Profile of mothers at risk: an analysis of injury and pregnancy loss in 1,195 trauma patients. JACS. 2005;200(1):49-56

6. Ikossi DG, Knudson MM, Morabito DJ et al. Continuous muscle tissue oxygen monitoring as a guide for resuscitation in critically injured patients: a prospective observational study. J Trauma. 2006;61(10):788-90.

7. Knudson MM, Ikossi DG, Speetzen LS, Morabito D. Thromboembolism after trauma: an analysis of 1,602 episodes from the American College of Surgeons National Trauma Data Bank (NTDB). Ann Surg. 2004;240(3):490-6;discussion;496-8.

8. Knudson MM, Vassar MJ, Straus EM, Hammond JS, Campbell S. Surgeons and injury prevention: what you don't know can hurt you! J Am Coll Surg. 2001;193:119-24.

9. Knudson MM, Khaw L, Bullard MK, Dicker R, Cohen MJ, Staudenmayer K, Sadjadi J, Howard S, Gaba D, Krummel T. Trauma training in simulation: translating skills from SIM time to real time. J Trauma. 2008;Feb;64(2):255-63;discussion 263-4.

10. Manley GT, Hemphill JC, Morabito D, Derugin N, Erickson V, Pitts LH, Knudson MM. Cerebral Oxygenation During Hemorrhagic Shock: Perils of Hyperventilation and the Therapeutic Potential of Hypoventilation. J Trauma. 2000;48:1025-33.

11. Rosenthal G, Morabito D, Cohen MJ, Roeytenberg A, Derugin N, Panter SS, Knudson MM, Manley G. Use of hemoglobin-based oxygen-carrying solution - 201 to improve resuscitation parameters and prevent secondary brain injury in a swine model of traumatic brain injury and hemorrhage: laboratory investigation. J Neurosurg. 2008;Mar;108(3):575-87.

12. Rozycki GS, Knudson MM, Shackford SR, Dicker R. Surgeon-performed Bedside Organ Assessment with Sonography Following Trauma (BOAST): A Pilot Study from the WTA Multi-center Group. J Trauma. 2005;59:1356-64.

13. Sciortino S, Vassar M, Radetsky M, Knudson MM. San Francisco pedestrian injury surveillance: Mapping, under-reporting, and injury severity in police and hospital records. Accident Analysis & Prevention. 2005;37(6):1102-13.

14. Vassar MJ, Holcroft JJ, Knudson MM, Kizer KW. Fractures in access to and assessment of *trauma systems. Journal of American College of Surgeons.* 2003;197(5):717-25.

15. Wan JJ, Morabito DK, Khaw L, Knudson MM, Dicker R. Mental illness as an independent risk factor for unintentional injury and injury recidivism. J Trauma. 2006;61:1299-304.

University of Iowa

1. Langer A, Lawrence E, Barry R. Using a vulnerability-stress adaptation framework to predict physical aggression trajectories in newlywed marriage. J Consulting Clinical Psych. 2008;76:756-68, 2008. (Won the 2008 ABCT Women's Special Interest Group Award for Outstanding Journal Article Written by a Student).

2. Murty SA, Peek-Asa C, Zwerling C, Stromquist AM, Burmeister LF, Merchant JA. Physical and emotional partner abuse reported by men and women in a rural community. Am J Public Health. 2003;93(7):1074-5.

3. Peek-Asa C, Runyan CW, Zwerling C. The Role of surveillance and evaluation research in the reduction of violence against workers. Am J Prev Med. 2001;20(2):141-8.

4. Peek-Asa C, Zwerling C, Stromquist AM, Burmeister LF, Merchant JA. Identification of risk factors for non-fatal child injury in a rural health area: Keokuk County Rural Health Study, Inj Prev. 2003;9(3):235-40.

5. Peek-Asa C, Maxwell L, Stromquist A, Whitten P, Lombos MA, Merchant J. Does parental physical violence reduce children's standardized test score performance? Ann Epidemiol. 2007;17(11):847-53.

6. Plumert JM, Schwebel DC. Social and temperamental influences on children's overestimation of their physical abilities: links to accident proneness. J Exp Child Psych. 1997;67:317-37.

7. Rizzo M, Reinach S, McGehee D, Dawson J. Simulated car crashes and crash predictors in drivers with Alzheimer disease. Arch Neurol. 1997;54(5):545-51.

8. Shootman H, Zwerling C, Miller ER, Torner JC, Fuortes L, Lynch DF, Merchant JA, Peterson TD. The Iowa Rural Injury Surveillance System: A method to electronically collect emergency department data. Ann Emerg Med. 1996.28(2):213-9.

9. Sihler KC, Hansen AR, Torner JC, Kealey GP, Morgan LJ, Zwerling C. Characteristics of twice-transferred, rural trauma patients. Prehosp Emerg Care. 2002;6(3):330-5.

10. Tiesman H, Young T, Torner JC, McMahon M, Peek-Asa C, Fiedler J. Effects of a rural trauma system on traumatic brain injuries. J Neurotrauma. 2007;24(7):1189-97.

11. Uc EY, Rizzo M, Anderson SW, Shi Q, Dawson JD. Driver route-following and safety errors in early Alzheimer's disease. Neurol. 2004;63(5):832-7.

12. Yang JZ, Marshall SW, Bowling JM, Runyan CW, Mueller FO, Lewis MA. Use of discretionary protective equipment and rate of lower extremity injury in high school athletes. Am J Epidemiol. 2005;161:511-19.

13. Yang J, Peek-Asa C, Jones MP, Taylor C, Young TL, Zwerling C. Smoke alarms by type and battery life in rural households: A randomized controlled trial. Am J Prev Med. 2008;35(1):20-4.

14. Zwerling C, Jones MP. Evaluation of the effectiveness of low blood alcohol concentration laws for younger drivers. Am J Prev Med. 1999;16(1S):76-80.

15. Zwerling C, Peek-Asa C, Whitten PS, Choi SW, Sprince NL, Jones MP. Fatal motor vehicle crashes in rural and urban areas: Decomposing rates into contributing factors. Inj Prev. 2005;11(1):24-8.

University of North Carolina at Chapel Hill

1. Amaya-Jackson L, Socolar RR, Hunter W, Runyan DK, Colindres R. Directly questioning children and adolescents about maltreatment - a review of survey measures used. Journal of Interpersonal Violence. 2000;15:725-59.

2. Foshee VA, Linder GF, Bauman KE, Langwick SA, Arriaga XB, Heath JL, McMahon PM, Bangdiwala S. The safe dates project: Theoretical basis, evaluation design, and selected baseline findings. Am J. of Preventive Medicine. 1994;12(5):39-47 Suppl Sep-Oct 1996.

3. Garrison HG, Runyan CW, Tintinalli J, Barber C, Bordley C, et al. Emergency department surveillance: an examination of issues and proposal for a national strategy. Annals of Emergency Medicine. 1994;24(5):849-55.

4. Guskiewicz KM, Weaver NL, Padua DA, Garrett WE. Epidemiology of concussion in collegiate and high school football players. The American Journal of Sports Medicine. 2000;28(5):1-8.

5. Guskiewicz KM, Ross SE, Marshall SW. Postural stability and neuropsychological deficits following concussion in collegiate athletes. Journal of Athletic Training. 2001;36(3)263-73.

6. Guskiewicz K, McCrea M, Marshall SW, Cantu RC, Randolph C, Barr W, et al. Cumulative effects associated with recurrent concussion in collegiate football players: the NCAA concussion study. JAMA. 2003;290(19):2549-55.

7. Guskiewicz KM, Bruce SL, Cantu RC, Ferrara MS, Kelly JP, McCrea M, et al.National Athletic Trainers' Association position statement: management of sport-related concussion. Journal of Athletic Training. 2004;39(3):280-97.
8. Keenan HT, Runyan DK, Marshall SW, Nocera MA, Merten DF, Sinal SH. A population-based study of inflicted traumatic brain injury in young children. JAMA. 2003;290: 621-6.

9. Loomis D, Wolf SH, Runyan CW, Marshall S, Butts JD. Homicide on the Job: Workplace and Community Determinants. American Journal of Epidemiology. 2001;154(5):410-7.

10. Marshall SW, Mueller FO, Kirby DP, Yang J. An evaluation of safety balls and face guards for prevention of injuries in youth baseball: a cohort study. JAMA. 2003;289(5):568-74.

11. Runyan CW, Gerken E. The Epidemiology and Prevention of Adolescent Injuries: A Review and Research Agenda. JAMA. 1989;262: 2273-83.

12. Runyan CW, Bangdiwala SI, Linzer M, Sacks J, Butts JD. Risk factors for fatal residential fires. New England Journal of Medicine. 1992;327(12):859-63.

13. Runyan,CW. Using the Haddon matrix: introducing the third dimension. Injury Prevention.1998;4:302-7.

14. Runyan DK, Hunter WM, Socolar RRS, Amaya-Jackson L, English D, Landsverk J, Dubowitz H, Browne DH, Bangdiwala SI, Mathew RM. Children who prosper in unfavorable environments: the relationship to social capital. Pediatrics.1998;101:12-8.

15. Runyan CW, Zakocs RC. Epidemiology and Prevention of Injuries among Adolescent workers in the U.S. Annual Review of Public Health. 2000;21:247-69.

University of Pittsburgh

1. Adelson PD, Bratton SL, Carney, NA, Chesnut RM, du Coudray HE, Goldstein B, et al. Guidelines for the acute medical management of severe traumatic brain injury in infants, children, and adolescents. Pediatric Critical Care Medicine. 2003;4 Suppl 3;S2-75.

2. Adelson PD, Ragheb J, Muizelaar JP, Johnson D, Kanev P, Brockmeyer D, et al. Phase II Clinical Trial of Moderate Hypothermia following Severe Traumatic Brain Injury. Neurosurgery. 2005;56(4):740-54.

3. Berger R, Adelson P, Richichi R, Kochanek P. Serum biomarkers after traumatic and hypoxemic brain injuries: Insight into the biochemical response of the pediatric brain to inflicted brain injury Dev Neurosci. 2006;28(4-5):327-35.

4. Berger R, Dulani T, Leventhal JM, Richichi R, Kochanek P. Identification of inflicted traumatic brain injury in well-appearing infants using serum and cerebrospinal fluid markers: A possible screening tool for inflicted traumatic brain injury. Pediatrics 2006;117:325-32.

5. Fabio A, Loeber R, Balasubramani G.K., Roth J, PhD; Fu W; Farrington DP. Why some generations are more violent than others: assessment of sge, period and cohort effects. American Journal of Epidemiology. 2006;164 (2):151-60.

6. Fabio A, Sauber-Schatz EK, Barbour KE, Li W. Association between county level Injury rates and racial segregation revisited: a multi-level analysis. American Journal of Public Health. In Press.

7. Jagannathan J, OKonkwo DO, Dumont AS, et al. Outcome following decompressive craniectomy in children with severe traumatic brain injury: a 10-year single-center experience with long-term follow up. J Neurosurg. 2007;106(4S):268-75.

8. Songer TJ, Dorsey RR. High Risk Characteristics for motor vehicle crashes in persons with diabetes by age. Annu Proc Assoc Adv Automot Med. 2006;50:335-51.

9. Songer T, Stephens-Stidham S, Peek-Asa C, Bou-Saada I, Hunter W, Lindemer K, Runyan C. *Core competencies for Injury and Violence Prevention*. Am J Public Health. In Press 2008.

10. Tomycz ND, Chew BG, Chang Yue-Fang, Darby JM, Gunn SR, Nicholas DH, et al. MRI is unnecessary to clear the cervical spine in obtunded/comatose trauma patients: the four-year experience of a Level I Trauma Center. The Journal of Trauma 2008;64(5):1258-63.

11. Wagner AK, Fabio A, Puccio AM, Hirschberg R, Li W, Zafonte RD, et al. Gender associations with cerebrospinal fluid glutamate and lactate/pyruvate levels after severe traumatic brain injury. Critical Care Medicine. 2005;33(2):407-13.

12. Wagner AK, Ren D, Conley,YP, Ma X, Kerr ME, Zafonte RD, et al. Sex and genetic associations with cerebrospinal fluid dopamine and metabolite production after severe traumatic brain injury. J Neurosurg 2007;106:538-47.

13. Kochanek PM, Safar PJ. Therapeutic hypothermia for severe traumatic brain injury [invited editorial]. JAMA. 2003.289(22):3007-9.

14. Kochanek PM. Pediatric traumatic brain injury: Quo Vadis. Dev Neurosci. 2006;28(4-5):244-55.

15. Weiss HB., Songer, T. J., & Fabio, A. (2001). Fetal deaths related to maternal injury. Jama, 286(15), 1863-8.

West Virginia University

1. Bossarte RM, Caine ED. Increase in U.S. suicide rates 2004. Injury Prevention. 2008;14(1):1-2.

2. Bossarte R, Swahn M. Interactions between race/ethnicity and psychological correlates of preteen alcohol use initiation among seventh grade students in an urban setting. Journal of Studies on Alcohol and Drugs. 2008;69:660-5.

3. Carr A, Bailes J, Helmkamp JC, Miele V, Rosen C. Neurological injury and death in all-terrain vehicle crashes in West Virginia: A 10-year retrospective review. Neurosurgery 2004;54:861-6.

4. Carter MW, Gupta S. Characteristics and outcomes in injury-related ED visits among older adults. American Journal of Emergency Medicine. 2008;26:296-303.

5. Coben JH, Fisher E. Evaluating the implementation of hospital-based domestic violence programs. Family Violence Prevention Health Practice. 2005;1(2):1-11.

6. Coben JH, Steiner CA, Barrett M. Completeness of cause of injury coding in healthcare administrative databases in the United States, 2001. Injury Prevention 2006;12:199-201.

7. Coben JH, Steiner CA, Miller TR. Characteristics of motorcycle-related hospitalizations: Comparing states with different helmet laws. Accident Analysis and Prevention 2007;39:190-6.

8. Coben JH, Steiner CA, Owens P. Motorcycle-related hospitalizations in the United States, 2002. American Journal of Preventive Medicine 2004;27(5):355-62.

9. Connelly CD, Hazen AL, Coben JH, Kelleher KJ, Barth RP. Persistence of intimate partner violence among families referred to child welfare. Journal of Interpersonal Violence. 2006;21(6):774-97.

10. Helmkamp JC. Family fun – family tragedy: ATV-related deaths involving family members. Injury Prevention. 2007;13(6):426-8.

11. Helmkamp JC, Bell J, Lundstrom W, Haque A, Ramprasad J. Assessing safety awareness and knowledge and behavioral change among West Virginia loggers. Injury Prevention 2004;10(4):233-8.

12. Helmkamp JC, Furbee PM, Coben JH, Tadros A. All-terrain vehicle-related hospitalizations in the United States, 2000-2004. American Journal of Preventive Medicine. 2008;34(1):39-45.

13. Helmkamp JC, Lawrence BA. The economic burden of all-terrain vehicle-related pediatric deaths in the U.S. Pediatrics. 2007;119(1):223-5.

14. Rockett IRH, Wang S, Lian Y, Stack S. Suicide-associated comorbidity among U.S. males and females: A multiple cause-of-death analysis. Injury Prevention 2007;13:311-5.

15. Swahn MH, Bossarte RM. Gender, early alcohol use, and suicide ideation and attempts: Findings from the 2005 Youth Risk Behavior Survey. Journal of Adolescent Health. 2007;41:175-81.

University of Alabama at Birmingham

1. Bayly PV, Cohen TS, Leister EP, Ajo D, Leuthardt E, Genin GM. Deformation of the human brain induced by mild acceleration. J Neurotrauma. 2005;22(8):845-56.

2. Cairns R, Cairns B. Lifelines and risks: pathways of youth in our time. Hemel Hempstead (UK): Harvester Wheatsheaf and New York: Cambridge University Press;1994.

3. Cairns R, Elder G, Costello E. Prospects for the future. In: R Cairns, G Elder Jr., J Costello, editors. Development science.New York: Cambridge University Press. 2001.

4. Dakin GJ, Eberhardt AW, Alonso JE, Stannard JP, Mann KA. Acetabular Fracture Patterns: Associations with Motor Vehicle Crash Information. J Trauma. 1999;47(6):1063-71.

5. Feldman D, Saltz R, Saltz M, Dimick A, Vasconez L, Sierra D. Experimental and clinical applications of fibrin glue. Journal of Plastic and Reconstructive Surgery. 1991;88(6):1005-15.

6. Grabowski DC, Morrisey MA. The effect of state regulations on motor vehicle fatalities for younger and older drivers: A review and analysis. Milbank Q. 2001;79(4):517-45.

7. Greenspan A, Wrigley M, Branche-Dorsey C, Kresnow M, Fine PFactors influencing failure to return to work due to traumatic brain injury. Brain Injury. 1996;10(3):207-8.

8. Hardy WN, Shah CS, Mason MJ, Kopacz JM, Yang KH, King AI, et al.. Stapp Car Crash Journal. 2008;52.

9. Mahoney J, Cairns R. Do extracurricular activities protect against early school dropout? Developmental Psychology. 1997;33:241-53.

10. McGwin G, Fine PR, et al. The epidemiology of fire related deaths in Alabama, 1992-1997. Am J Burn Care and Rehabilitation. 1999;1:75-84.

11. Meythaler JM, Peduzzi JD, Eleftheriou E, Novack TA. Current Concepts: Diffuse Axonal Injury – Associated Traumatic Brain Injury. Arch Phys Med Rehabil. 2001;82:1461-71.

12. Morris DM, Uswatte G, Crago J, Cook EW, Taub E. The Reliability of the Wolf Motor Function Test for Assessing Upper Extremity Function after Stroke. Archives of Physical Medicine and Rehabilitation. 2001;82:750-5.

13. Rosner M, Rosner S, Johnson Cerebral perfusion pressure: management protocol and clinical results. Journal of Neurosurgery. 1995;82:949-62.

14. Webb C, Wrigley M, Yoels W, Fine P Explaining quality of life for persons with traumatic brain injuries two years after injury. Archives of Physical Medicine and Rehabilitation. 1995;76:1113-9.

15. Zhou C, Roseman J Agricultural injuries among a population-based sample of farm operators in Alabama. American Journal of Industrial Medicine.1994;25:385-402.

Harvard University

1. Graham JD. Preventing automobile injury: new findings from evaluation research. Dover Massachussetts: Auburn House; 1988.

2. Graham JD, Thompson KM, Goldie SJ, Segui-Gomez M, Weinstein MC. The cost-effectiveness of air bags by seating position. JAMA. 1997;278:1418-25.

3. Guyer B, Ellers B. Childhood injuries in the United States: mortality, morbidity and cost. American Journal of Diseases of Children. 1990;44:649-52.

4. Guyer B, Gallagher SS, Chang BH, et al. Prevention of childhood injuries: evaluation of the Statewide Childhood Injury Prevention Program (SCIPP). American Journal of Public Health. 1989);79:1521-7.

5. Prothrow-Stith D. Deadly consequences deadly consequences/how violence is destroying our teenage population and a plan to begin solving the problem. NY: Harper Collins; 1991.

6. Hemenway D, Solnick SJ, Azrael DR. Firearm training and storage. JAMA. 1995; 273:46-50.

7. Hemenway D. Survey research and self-defense gun use: An explanation of extreme overestimates. Journal of Criminal Law and Criminology. 1997;87:1430-45.

8. Hemenway D, Colditz GA, Willett WC, Stampfer MJ, Speizer FE. Fractures and lifestyle—effect of cigarette smoking, alcohol intake and relative weight on the risk of hip and forearm fractures in middle-aged women. American Journal of Public Health. 1988;78:1554-8.

9. Hemenway D. Private guns public health. Ann Arbor: University of Michigan Press; 2004.

10. Hemenway D. While we were sleeping: success stories in injury and violence prevention. Berkeley, CA: University of California Press; 2009.

11. Kennedy BP, Kawachi I, Prothrow-Stith D. Income inequality, social capital and firearm violent crime. Social Science Medicine. 1998;47(1):7-17.

12. Miller M, Azrael D, Hemenway D. Household firearm ownership levels and suicide across U.S. regions and states, 1988-1997. Epidemiology. 2002;13:517-24.

13. Miller M, Azrael D, Hemenway D. Firearm availability and unintentional firearm deaths, suicide and homicide among 5-14 year olds. Journal of Trauma. 2002;52:267-75.

14. Sege R, Dietz W. Television viewing and violence in children: the pediatrician as agent for change. Pediatrics. 1994;94(4Pt2): 600-7.

15. Shinoda-Tagawa T, Clark DE. Trends in hospitalization after injury: Older women are displacing young men. Injury Prevention. 2003;9:214-19.

Appendix G: Examples of Outreach to Local Communities

Examples of ICRC Outreach to Local Communities

The Harvard ICRC worked with the local community to develop a violence prevention curriculum, *PEACEZONE,* for elementary schools. This program, which has been delivered to more than 5,000 students, is designed to increase students' ability to heal after an act of violence has been committed, make positive decisions, and avoid risk taking. Research has demonstrated that the *PEACEZONE* curriculum improves student behavior. As a result, the Harvard ICRC has worked with community partners to develop, evaluate, and improve the *PEACEZONE* curriculum, which has been adopted by elementary schools in Boston and elsewhere.

The Colorado Injury Control Research Center with the Salud Family Clinic on community educational programs targeting injury prevention. Through this collaboration, the center receives input from low-income families and migrant workers and the practitioners who care for them to ensure that its programs address pressing needs for their underserved populations. The health and safety fairs conducted by Salud Family Clinic reach thousands of people every year. The center, Salud, and the University of Colorado, Denver, collaborated on a research project funded by the U.S. Department of Housing and Urban

Salud Family Clinic Health Fair, Fort Lupton, Colorado: Smoke detector giveaway program.

Development to evaluate housing safety among recently arrived immigrant families.

The Johns Hopkins University Center for Injury Research and Policy has partnered with the Baltimore City Fire Department for 12 years. They are now testing ways in which mobile safety resource centers can be brought to communities to disseminate proven, effective safety products. The Johns Hopkins CARES Mobile Safety Center is a partnership activity led by the Center and the fire department. To create the mobile safety center, Center faculty also worked with the Maryland Institute College of Art to design the vehicle and create materials that communicate injury prevention information for parents. This relationship has continued to evolve and MICA works with Center faculty on a variety of other community education projects and scholarly seminars for faculty of the two institutions.

The Center works with the fire department to ensure that fire prevention/safety promotion activities are recognized as part of the job of the firefighters and that these responsibilities are incorporated into fire department policies. With federally funded research grants, the Center is conducting key informant interviews with city council members, the mayor's office, the housing authority, and the fire department in order to assess the importance and need for the injury prevention services offered by the fire department. One example of these injury prevention services is the fire department's home visiting program through which free smoke alarms are installed and home fire hazards are identified. The Center is currently working with the fire department to enhance their data system capability, which will allow them to better document where smoke alarms are needed and installed and where lives have been saved because of smoke alarms. The Center and the fire department are also collaborating on funded

intervention research that will expand their home visiting program to include carbon monoxide alarms and hot water safety, as well as enhanced community promotion of home safety.

The University of Pittsburgh Center for Injury Research and Control worked with schools in the city to present the Think First for Kids program to students in first, second, and third grade. The program was developed by the American Association of Neurological Surgeons and the Congress of Neurological Surgeons. "Think First for Kids is designed to help students develop safety habits that will minimize the risks of brain and spinal cord injuries," said Darius Carlines, center researcher and course director. "This represents a new effort to expand the message of safety to the elementary-school-aged population." The presentation focuses on five areas: vehicular safety, bicycle safety, playground safety, water safety, and violence. Each hour-long lesson begins with a videotape that introduces safety messages. Messages are then reinforced by posters, coloring books, and comic strips featuring StreetSmart, a safety superhero. The University of Pittsburgh Center for Injury Research and Control has worked with 98 school teachers, school nurses, principals, parents, and guidance counselors in 58 school districts and 27 private schools to implement the Think First For Kids curricula into the school plans. For the 2007-2008 school year, the Think First For Kids program was implemented into 48 schools and presented at 55 assembly sessions, reaching 7,404 children in grades K-3. As part of the assembly program, children are fitted for bicycle helmets and given the helmets as an incentive. In the last 5 years,

Darius Carlins conducting the Think First for Kids presentation at an elementary school in Pittsburgh.

The University of Pittsburgh Center for Injury Research and Control has supported the distribution of 5,727 helmets in this program.

For over 10 years, the University of Iowa Injury Prevention Research Center has partnered with the Iowa Department of Public Health. They worked together to pass legislation that established the state trauma system. Together the partners designed and implemented the system, and they are now conducting ongoing evaluations of the system. The center also works closely with the Bureau of Emergency Medical Systems (EMS) on injury data registry issues and child passenger safety issues. Center representatives served as unintentional injury and violence chapter leaders in the Healthy Iowa 2010 development and update process. The Center also co-sponsors with Blank Children's Hospital in Des Moines an annual child and youth statewide injury prevention conference.

Appendix H: Examples of ICRC Global Outreach

Examples of ICRC Global Outreach

Many centers believe that the resources, expertise, and experience they have as the result of their ICRC center funding should be leveraged and shared in order to build the injury prevention and control field internationally. Although international collaborations are not an FOA requirement, many of the centers obtain grants from other sources in order to conduct research and trainings with international partners. These opportunities often are the result of preexisting relationships with researchers in host countries. The ICRCs identified several examples of collaborative work that span borders and reach international communities.

The UNC Injury Prevention and Research Center has hosted several international scholars for extended visits from Australia, Brazil, Chile, Kenya, Sweden, Spain, and New Zealand, while several domestic investigators have pursued postdoctoral studies or faculty sabbaticals at the center. In addition to hosting visiting scholars, the center offers seminars at least monthly throughout the academic year. Since 2004, the center has hosted 80 seminars, including nine presented by visiting scholars, who spent additional time meeting with students and faculty to discuss research ideas.

The San Francisco Injury Center is a pioneer in the use of ultrasound for identifying injuries and has designed courses for training programs in the United States, as well as in Uganda. The center has also taught ultrasound to all three branches of the military.

The Harvard Injury Control Research Center organized two regional trainings for members of the state suicide prevention teams in 2002 and 2003 as part of its collaboration with the Northeast Injury Prevention Network, which is composed of injury control professionals in the

eight state health departments in the northeast region. The center then worked with the Educational Development Center and received funding from the Health Resources and Services Administration's (HRSA) Maternal and Child Health Bureau to establish the National Center for Suicide Prevention Training, which has provided online training to more than 3,000 professionals from the United States and 19 other countries. The center published two articles about the trainings (Browne, Barber, et al. 2005; Stone, Barber, and Potter 2005), and a book chapter is currently in press (Stone, Barber, and Posner, 2009).

Appendix I: Works Cited

Works Cited

1. Office of Extramural Research, CDC. CDC Peer Review Policy. Atlanta, GA: CDC; 2008.
2. Centers for Disease Control and Prevention. (1999). Framework for program evaluation in public health. *MMWR;* 48 (No. RR-11).
3. National Academy of Sciences. (2004). *NIH Extramural Center Programs: Criteria for initiation and evaluation*. National Academies Press, Washington, D.C.
4. Engel-Cox, J.A., van Houten, B., Phelps, J. & Rose, S.W. (2008). Conceptual model of comprehensive research metrics for improved human health and environment. *Environmental Health Perspectives*, 116, 5, 583-592.
5. W.M. Kellogg Foundation. (2004). *Logic model development guide*. Battle Creek, MI.
6. Quinlan, K.M., Kane, M., & Trochim, W.M.K. (2008). Evaluation of large research initiatives: Outcomes, challenges, and methodological considerations. In C.L.S. Coryn & M. Scriven (Eds.) Reforming the evaluation of research. *New Directions for Evaluation,* 118, 61–72.
7. Borgman, C.L., & Furner, J. (2002). Scholarly Communication and Bibliometrics. In B. Cronin (Ed.), *Annual Review of Information Science and Technology, Vol 36.* Medford, NJ: Information Today, 3–72.
8. Association of Schools of Public Health. (2004). *Injury Prevention and Control in Accredited Schools of Public Health. 2002-2003 Summary of Research, Faculty Expertise, Curricula, and Training.*
9. Langlois JA, Wallen BAR, Teret SP, et al. (1991). The impact of specific toy warning labels. *JAMA*; 265(21):2848-2850.

10. Grabowski D.C., & Morrisey M.A. The effect of state regulations on motor vehicle fatalities for younger and older drivers: A review and analysis. *Milbank Q* 2001; 79(4): 517–545.
11. NIH, Office of Extramural Research, Types of Grant Programs, accessed July 2, 2009: http://grants.nih.gov/grants/funding/funding_program.htm#RSeries.
12. National Academy of Sciences. *NIH Extramural Center Programs: Criteria for Initiation and Evaluation*. National Academies Press, Washington, D.C., 2004.
13. Iowa Department of Public Health, *The Burden of Injury in Iowa, Comprehensive Injury Report, 2002-2006*. December 2008.